

Motion also can be created by an action/reaction situation. A good example of this is a space rocket. A space rocket blasts hot gas down with great force, which causes the rocket to shoot up into the atmosphere. This is similar to a sprinter pushing off the ground to run faster.

Motion can be subject to centrifugal force and centripetal force. **Centrifugal** force pulls outward from the center in a line. **Centripetal** force pulls in toward the center and forms a circle. It is the force that is necessary to keep an object moving in a curved path and directed

toward the center of rotation. When a weight tied to a string is swirled in a circle, the string exerts centripetal force on the weight, pulling and directing it inward.

When a bike is in motion, its momentum makes it tend to go in a straight line. If the bike is ridden around a curve, the centrifugal force tries to fling the bike away from the direction of the curve so the bike will continue in a straight path. This is why a bike rider leans into a curve (but not too much!) to stay upright.

Exercise

1. What is motion? _____

2. How are position, motion, and frame of reference related? _____

3. What does Newton's first law of motion describe? _____

4. What does Newton's second law of motion describe? _____

5. How are inertia, mass, and force related? _____

6. How are speed, velocity, and acceleration different? _____

7. What is the difference between centrifugal and centripetal forces? _____
