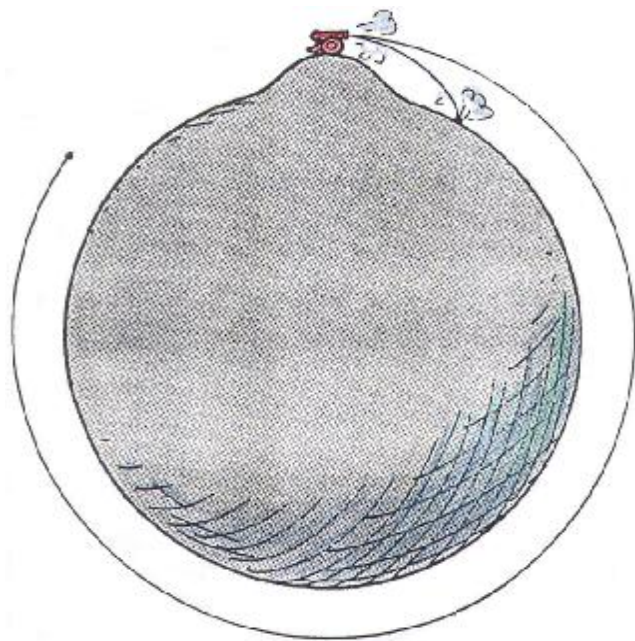


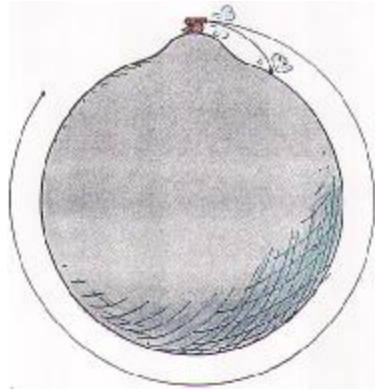
NEXT-TIME QUESTION



A cannonball is fired horizontally from a tall mountain to the ground below. Because of gravity, it strikes the ground with increased speed. A second cannonball is fired fast enough to go into circular orbit—but gravity does not increase its speed. Why?



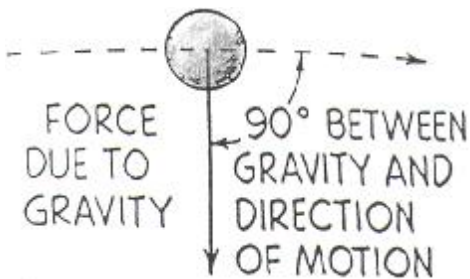
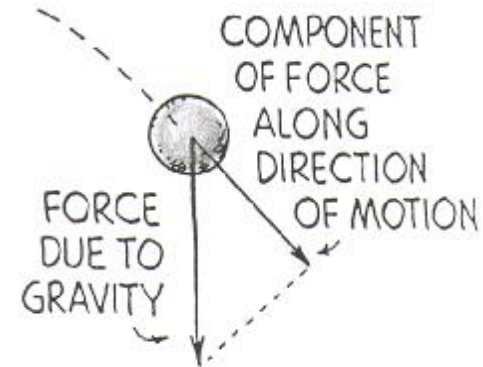
Next-Time Question



A cannonball is fired horizontally from a tall mountain to the ground below. Because of gravity, it strikes the ground with increased speed. A second cannonball is fired fast enough to go into circular orbit—but gravity does not increase its speed. Why?

Answer:

The first cannonball moves downward, so there is a component of gravitational force along its direction of motion that speeds it up.



The second cannonball moves perpendicular to the gravitational force, with no force component along its direction of motion. That's why it orbits at constant speed.