



Action Is Reaction

Topic

Newton's third law



Time

30 minutes



Safety

Please click on the safety icon to view safety precautions.

Materials

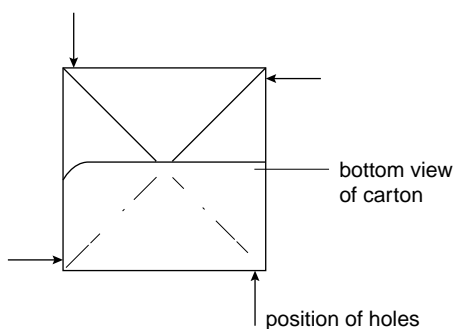
one empty cardboard milk carton
(quart size)
string

water
water container or sink
nail

Procedure

1. Using the nail, make four holes at the bottom of each side of the milk carton (see figures 1 and 2).
2. With the nail, make another hole in the top of the carton (see figure 1).
3. Tie a string to the hole in the top of the carton.
4. Fill the carton with water. Make sure that the carton is in the sink or water container, but not resting on the sink, just dangling slightly above it.
5. Hold the carton by the string. Observe.

Figure 1



What's Going On

The water squirts out of the holes (action) in the milk carton. The equal and opposite reaction has the milk carton spinning in a counterclockwise direction. If the holes are in the left-hand corner, the carton will turn in a clockwise direction.

Connections

All of the launch vehicles utilize Newton's third law of action vs. reaction to propel them into space. The vehicles employ multiple stages in the propulsion sequence. The Saturn V rocket was designed for the moon missions from 1967 to 1973. Saturn V had 12 successful flights; it is considered to be the most powerful rocket of the NASA vehicles. It was last used in 1973 when it propelled the Skylab space station into earth orbit.

Figure 2

