

Marbles At Work

Materials

An old manila file folder
Marbles or tiny balls of various sizes
A ruler
Tape



Procedure

1. Cut out the bottom of the file folder, leaving about two inches on each side of the fold. Cut an additional piece out of one of the discarded sides, approximately 3 inches by 6 inches. Fold this piece in half to get a small square "book".
2. Place two strips of tape on a table, about 6 inches long and about 4 inches apart.
3. Set the small "book" up with the fold on the far edge of one strip of tape, open side facing the other strip of tape. The bottom side of the "book" should be lying flat on the table and the other side should be standing as straight up as possible, making somewhat of a little "goal" to aim for.
4. Set the file folder up like a tray for the marble to roll down, facing the "goal", with its front side on the inside edge of the other strip of tape.
5. Barely elevate the file folder tray and roll a marble down it, pushing the goal. Measure the distance the goal moves.
6. Reset the goal and the tray, but this time elevate the tray further. Again measure how far the goal moves. Repeat with greater and greater elevations, and try using larger or smaller balls. Try to form a hypothesis as to what determines the amount of "work" a rolling ball can do (in this case measured by how far the goal is moved).

It takes energy to do work, and anytime an object is moved, work is being done. An object rolled down a steep grade does more work than one rolled down a gradual incline. Also, an object with a greater mass has more force (energy) when it hits a stationary object than one with a lesser mass.

