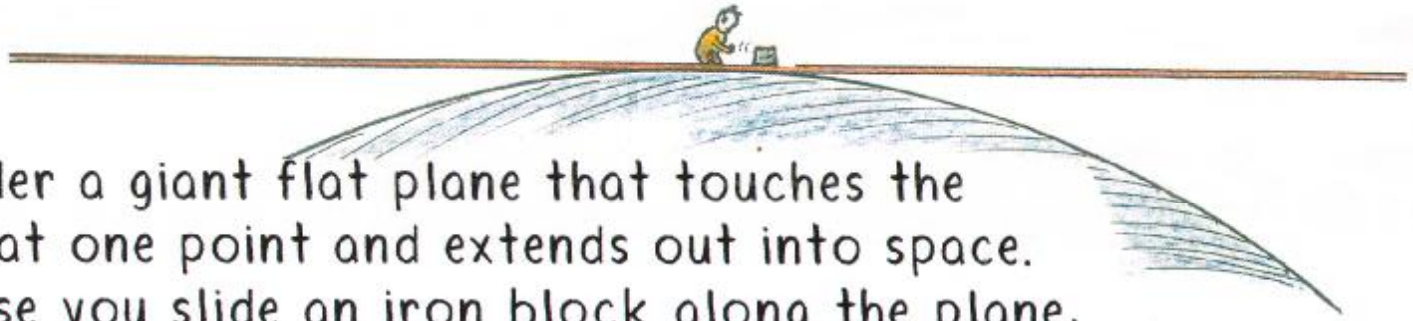
NEXT-TIME QUESTION



Consider a giant flat plane that touches the Earth at one point and extends out into space. Suppose you slide an iron block along the plane, where it makes contact with the Earth.

Suppose also that the plate is perfectly frictionless, air resistance is absent, and $v_0 < v_{escape}$. The block will

a) continue at constant velocity, in accord with the law of inertia.

b) increase in speed as the force of gravity on it weakens with distance.

c) decrease in speed due to the pull of gravity.

d) oscillate to and fro.

Galileo considered this nearly 5 centuries ago!

thanx to Ken Ford

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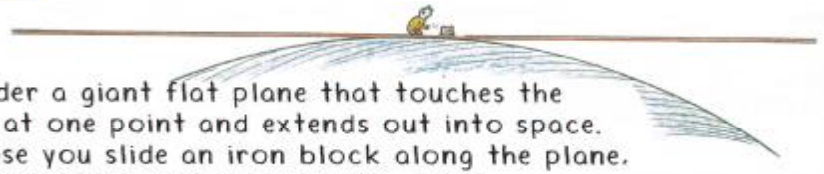

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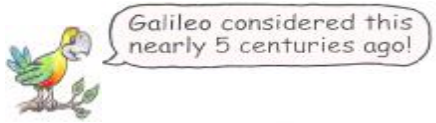

Answers: d. oscillate to and fro

If you answered *c*, not bad; but *d* is the better answer. The force of gravity on the block is perpendicular to the plane only at the point of contact with the Earth. As the block slides farther out on the plane, a component of gravitational force parallel to the plane decreases its speed (it travels somewhat "upward" against Earth's gravity). But sliding against gravity does more than merely reduce its speed—the block finally comes to a stop. What happens then? It slides back and the process is repeated in cyclic fashion. From a flat-Earth point of view, the situation is equivalent to that shown in the sketch.