# Box o’ toys.

**Position**

time (s)

**Velocity**

**Acceleration**

time (s)

time (s)

2

4

6

2

4

6

2

4

6

|  |  |
| --- | --- |
| **time interval** | **F**child on box  (newtons) |
| 0 to 2 sec. | 120 |
| 2 sec. to 4 sec. | 100 |
| 4 sec. to 6 sec. | 90 |

Starting at *t* = 0, a child pushes horizontally on a box, making it slide across the floor. Friction exerted by the floor on the box opposes its motion with a force of 100 newtons. The child pushes with a force that changes, as this table shows.

On the axes to the right, sketch the box’s position, velocity, and acceleration vs. time.

# Tossed ball

Gerardo tosses a ball straight up. Neglecting air resistance, which of the following choices best describes the forces acting on the ball *after* it leaves Gerardo’s hand but before it reaches its peak?

#### There’s a downward gravitational force and an upward force from the throw. The upward force gets smaller as the ball rises.

#### There’s a downward gravitational force and an upward force from the throw. The upward force is constant but weaker than the gravitational force.

#### There’s a downward gravitational force only.

Explain your reasoning.