

Name _____

The Forces Around Us

Open-Ended Response Answer Key

1. Gravitational force is essential in maintaining the stability of our solar system, holding planets in orbit around the Sun. It also gives weight to objects, making them fall when dropped. The force of gravity affects everything from tides to the way we move on Earth's surface.
2. Balanced forces result in no change in motion, as seen when you push a book with equal force in both directions, and it doesn't move. Unbalanced forces, like a stronger push in one direction, cause acceleration or changes in motion, such as the book moving.
3. In a world without friction, vehicles would not have traction, making driving and stopping extremely challenging. Sports like ice skating would not be possible, and industrial processes that rely on friction, like manufacturing and transportation, would require significant redesign.
4. Recent advancements in the understanding of forces include the development of materials with controlled friction properties for various applications. For example, scientists have engineered surfaces with "smart" friction that can be adjusted for different purposes, from reducing wear and tear to improving grip in sports equipment.

