

Name _____

Friction: The Invisible Force That Shapes Our World

Open-Ended Response Answer Key

1. (Possible response) In a sled race, reducing friction between the sled's runners and the icy track can make the sled go faster. This can be achieved by applying a lubricant like wax to the runners, reducing surface contact and friction.
2. (Possible response) Friction is vital in sports like soccer, where players rely on friction between their shoes and the field to change direction and control the ball. In rock climbing, friction between climbing shoes and the rock surface allows climbers to grip and ascend safely.
3. (Possible response) To reduce friction, I would design the train with streamlined shapes to minimize air resistance. Additionally, I would use materials with low friction coefficients for the train's wheels and tracks, and implement advanced braking systems for precise control at high speeds.
4. (Possible response) Engineers can reduce friction by using lubricants and materials with low friction coefficients, implementing maintenance schedules, and employing precision machining techniques to create smoother surfaces. Additionally, advancements in materials science can lead to the development of self-lubricating materials and coatings.

