

## Long Answer Questions

**Q. 1. Give reason:** [NCERT Exemplar]

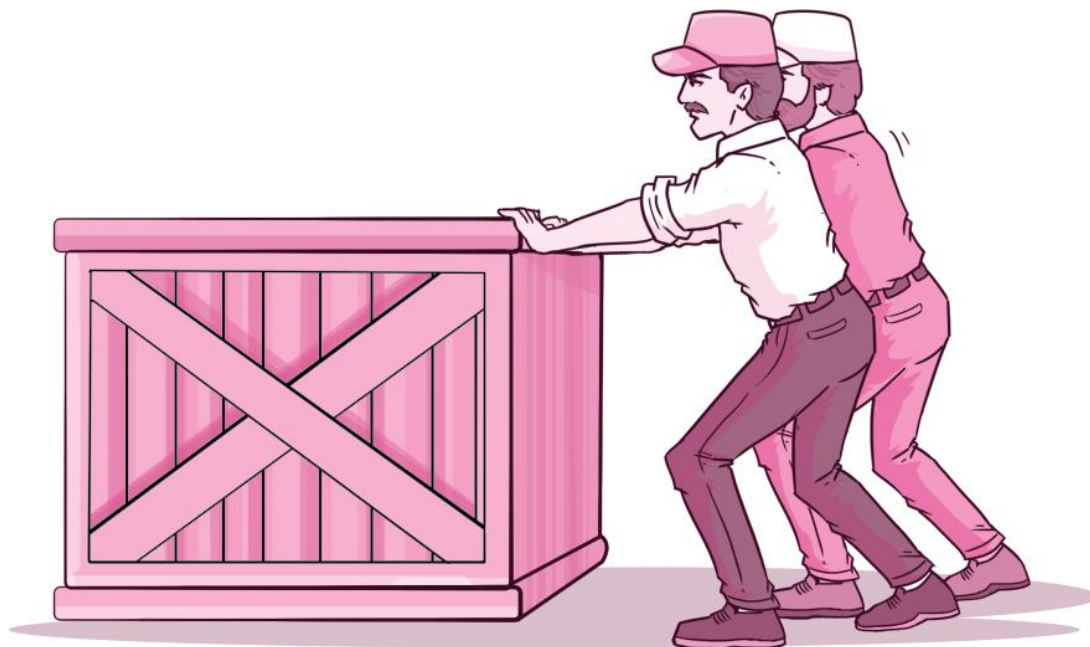
**(i)** We have two identical metal sheets. One of them is rubbed with sand paper and the other with ordinary paper. The one rubbed with sand paper shines more than the other.

**(ii)** While travelling on a rickshaw, you might have experienced that if the seat cover is very smooth, you tend to slip when brakes are applied suddenly

**Ans. (i)** The friction between sand paper and metal sheet is very large, compared to that between the ordinary paper and the metal sheet. Thus, the sand paper is able to remove the outer dull layer from the metal sheet more effectively and makes it more shining.

**(ii)** If the seat cover is very smooth then the friction between our body and the seat is very small. Therefore, when the brakes are applied we tend to slip.

**Q. 2. Two friends are trying to push a heavy load as shown in figure. Suggest a way which will make this task easier for them.** [NCERT Exemplar]



**Ans.** They can put rollers below the heavy load. Because, friction arises when the irregularities in the surfaces of two objects in contact get interlocked with each other. In rolling, the time given for interlocking is very small than sliding. Hence, interlocking is not strong. Therefore, less force is required to overcome it and the task becomes easier. Since, the rolling friction is smaller than the sliding friction, putting rollers below the heavy load will make the task easier for them.

**Q. 3. What are the different methods to reduce friction?**

**Ans.** To reduce friction following methods are commonly used:

- a. **Polishing:** If we polish a surface, it becomes smooth and friction is reduced. Through polishing, unevenness of the surfaces is reduced.
- b. **Lubricating:** By applying lubricants (like oil) to surfaces, friction is reduced. When we apply lubricant to surfaces, a thin layer of lubricant is formed over there and moving surfaces do not directly rub against each other.
- c. **Using ball bearings:** This way of reducing friction involves the principle that an object is rolled instead of sliding. The use of ball bearing converts sliding friction into rolling friction.
- d. **Separation of surfaces by air:** Another way of reducing friction is to separate the surfaces by air. This is how, a hovercraft works. A hovercraft moves on a layer of air between its hull and the water. The layer of air reduces friction allowing the hovercraft to move easily.
- e. **Giving a streamlined shape:** Boats, cars, planes and rockets are streamlined to reduce friction with water or air.