



# KALPAVRUKSHA MODEL SCHOOL

## Answers of Assignments-4

Class: VIII

Sub: Physics

Date: 6.08.2021

Topic: FORCE AND FRICTION

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### I. Answers:

1. **Explain why it is easier to drag a mat on the floor when nobody is sitting on it but much more difficult to drag the same mat when a person is sitting on it.**

Ans: Friction is caused by the inter locking of the irregularities in the two surfaces. When two surfaces are pressed harder together, the force of friction increases so it is much more difficult to drag the mat when a person is sitting on it. Therefore, it is easy to drag a mat when no one is sitting on it rather than when a person is sitting on it because weight is less and friction caused is less.

2. **Define friction.**

Ans: The resistance to motion experienced when two surfaces in contact move with respect to each other is called friction.

3. **Write an activity to show that friction depends on the surface of area in contact.**

ANS: Take a sheet of paper, a handkerchief, a hand towel, a rectangular piece of glass and wood as surfaces and a pencil, Now roll the pencil or dry cell on each surface. 3 Number the surfaces in the order in which the pencil rolled easily on them. Measure the distance travelled by the pencil or dry cell Also, mention whether the surface is rough or smooth.

4. **Write an activity to show that friction depends mass of the object.**

ANS: Suppose, a person is pushing a heavy box, then he is applying force now if the same person pushes two boxes of same mass as the previous case. Then, in this case he will have to apply more force to overcome the larger friction as in the earlier case. Thus is because friction depends on the mass of the object. Heavier the mass, more the force is exerted by the object on the surface in contact and thus more friction is produced.

**5. Differentiate between rolling and sliding friction. (Any two)**

ANS:

Sliding friction	Rolling friction
1. When the surface of one body is sliding against the surface of another body, sliding friction comes into play.	1. When the surface of one body is rolling against the surface of another body, rolling friction comes into play.
2. Sliding friction occurs due to interlocking between microscopic bumps on surfaces	2. Rolling friction occurs due to deformation of surfaces

**6. Explain why sliding friction is less than static friction.**

ANS: Friction comes into play when irregularities present in the surfaces of two objects in contact get interlocked with each other. In sliding, the time given for interlocking is very small. Hence, interlocking is not strong. Therefore, less force is required to overcome this interlocking. But, when the object is at rest, the surfaces interlock well, therefore friction is more. This explains sliding friction is less than static friction.

**7. Out of sliding friction, static friction & rolling friction:**

(a) which one is the smallest-?

(b) Which one is the largest-?

ANS: Out of sliding friction, static friction & rolling friction

a) Rolling friction is smallest.

b) Static friction is largest.

**8. Write an activity to show that rolling friction less than sliding friction.**

ANS: **Moving Books**

**Materials:**

- books (4 per student/pair/group)
- unsharpened pencils (10-15 per student/pair/group)

**Procedure:**

- Students will slide a stack of four books across the surface of their desk.
- Students will lay unsharpened pencils next to each other so that the pencils are approximately  $\frac{3}{4}$  inch apart. Students will place the stack of books on top of the pencils at one end of the line of pencils. Students

will move the books across the table so that the pencils roll under the books.

- Students will repeat the experiment while recording their observations about the effort required moving the books in each of these scenarios. We can conclude by observations that rolling is less than sliding friction.

**9. What is the name of 'special shape' which is given to objects moving through fluids to reduce drag?**

ANS: Streamlined shape is given to objects moving through fluids to reduce drag to reduce friction.

**10. Explain why objects moving in fluids must have special shapes.**

ANS: The object moving in fluids must have a special shape. This type of shape is called streamlined shape. The streamlined shape helps to overcome the friction between objects and fluids. The objects have pointed fronts with little broader middle portion which gets tapered at the back. When cars and aero planes move at very high speeds, their motion is opposed by friction offered by the air molecules surrounding them. The friction of air produces what is called drag, which opposes the motion of the vehicle. The same applies to ships and boats. To reduce drag, automobiles, ships and aero planes are given a special shape, called a streamlined shape. An automobile with a streamline body experiences minimum resistance when travelling through air. Even sea creatures like fish and shark have streamline bodies, which make it easier for them to move with great speed in water.

**11. What is the special name of frictional force exerted by fluids (like air or water)?**

ANS: fluid friction is the special name of frictional force exerted by fluids (like air or water).

