SUMMARY

Friction and its Types

Friction is a force that opposes the **relative motion**between two surfaces of objects in contact. The force of friction always acts in a direction **opposite** to that of the**applied force**. Friction is due to **irregularities** on the surfaces of the objects in contact. Friction depends on the **smoothness** of the surfaces in contact. The force of friction depends on the **nature of the surfaces** in contact. The force of friction increases if the surfaces are pressed harder. Frictional force that comes into action before the start of the motion of an object is called **static friction**. When an object slides over another surface, the frictional force that comes into action is **sliding friction**.

When a roller rolls over a surface, the frictional force that comes into action is **rolling friction**. Rolling friction is less than sliding friction, while sliding friction is less than static friction. Friction due to gases and liquids is called **fluid friction**, and is also called **drag**. Friction is a**necessary evil**. There are instances in daily life where friction is a necessity. For example, without friction, we cannot hold objects in our hands; we cannot walk and cannot light a match stick. Examples where friction has to be minimised and not desirable is the friction between machinery parts, which causes wear and tear.

Minimising Friction

Friction is a necessary evil. Without friction, we cannot walk, hold articles, the brakes of automobiles do not work, and the power of a motor cannot be transferred to a grinding machine.

However, friction is undesirable in certain areas and we need to reduce it. Friction between the **sliding surfaces**of two objects can be reduced by making the surfaces in contact smooth by **polishing the surfaces**. **Sliding friction** between the moving parts of vehicles can be reduced by using oil, grease or graphite.

In electrical plugs, **graphite** is used to reduce friction between the plug pins and the corresponding socket. In certain machines, like the drill used by a dentist, a **layer of air** is used as a lubricant to reduce friction between the moving parts.

The **interlocking of irregularities** on the surfaces of two bodies in contact, which cause friction, is overcome to great extent by the use of **lubricants,** the material used to reduce friction, and friction is reduced. **Rolling friction** is less than sliding friction. Hence, sliding friction is replaced by rolling friction by using rollers, like **ball bearings** between the hub and the axles in the moving parts of machines and vehicles. When an object moves through a fluid, the friction offered is called **fluid friction**. It is also called **drag**. Fluid friction depends on the shape of the object and the nature of the fluid. Aeroplanes, boats, fishes and birds which move through fluids have bodies of special shape so as to reduce the friction due to fluid.