



STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING  
TELANGANA, HYDERABAD  
ACADEMIC YEAR – 2020-21, LEVEL - 2

Class: VIII

Medium: English

Subject: Physical Science

Name of the chapter : Friction

Worksheet: 13

Topic/ Concept: Variation of Friction - FBD

**Concept:** Variation of Friction

**Learning Outcomes:**

The Students.....

1. Differentiate static friction and sliding friction.
2. Draw the FBD of Limiting force of the static friction.
3. Give reasons for objects not moving even when a force is applied on them.

- ✓ What is the reason for an object not moving even when a force is applied on it?
- ✓ What are the changes in the frictional forces if an object moves from its place?
- ✓ What are the differences between static friction and sliding friction?
- ✓ What are the changes taking place on an object when a force is applied on it?

**Static Friction:** It is the friction which comes into play when surfaces of the objects are at **rest relative** to each other.



**Sliding Friction:** It is the friction which comes into play when the surface of one object **moves relatively** to the surface of another object



## Activity-1: Observing the variation of friction

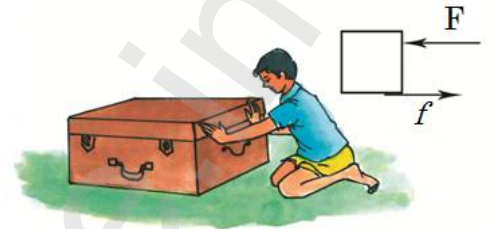
### Case - 1

If you push a heavy box which is kept on a floor with a small force to move horizontally as shown in figure. The box does not move because there is a frictional force which is equal and opposite to the applied force on the box.



### Case - 2

Now gradually increase the applied force, box still does not move. Because the frictional force also increases accordingly and thus balances the increased applied force. From this experience we conclude that static friction is a self-adjusting force.



### Case - 3

But there is a limit to this static friction. As you keep on increasing the applied force, at some point the box starts moving. That is, when the applied force is more than the limit of the static friction, the body starts to move as shown in figure.



When static friction acts between two objects, more force is required to overcome interlocking between the irregular surfaces. Once the object comes into motion, this force is not necessary. So sliding friction is less than the static friction.

Sliding friction < Static friction.

## ASSESSMENT

### I. Answer the following questions:

1. How can you say that sliding friction is less than static friction?
2. Is it easy to walk on soapy watered marble floor? Why?
3. Differentiate between sliding friction and static friction.
4. Draw the FBD to show the changes in the frictional force caused by the increase in applied force.

### II. Match the following.

1. Static friction is also known as ( )  
A) Self adjusting force      B) External friction  
C) Internal friction      D) Sliding friction
2. Sliding friction is \_\_\_\_\_ to static friction. ( )  
A) Equal      B) More  
C) Less      D) Cannot be determined