

Pre- Content/Content /Post –content	Learning Outcome/ Objectives	
	<u>General</u>	<u>Specific</u>
<u>Pre –Content :</u> Teacher will ask questions and motivate the students and introduce the lesson by recalling the previous lesson that friction is an opposing force. Few examples are reinforced: • A car slows down on applying brakes • A ball rolling on the ground, stops after sometime. • It is difficult to walk on a smooth floor. • We slip on a banana peel. <u>Content :</u> • Force of friction • • Types of friction • • Role of friction • Drag • Streamlined bodies. <u>Post Content :</u> Able to appreciate that friction is a bane and boon. Life would not be possible if there was not friction. Also, at times it is a disadvantage and we have to take steps to minimize it.	Students will be able to- • discover the term friction. • identify the types of friction. • tabulate advantages and disadvantages of friction. • propose methods to increase and decrease friction. • relate to Fluid Friction • justify the need to streamline the objects. • appreciate the role of friction in our life.	Students will be able to:- • develop the definition of friction • identify the causes of friction. • classify and distinguish friction into • Static • Sliding • Rolling • state examples of the types of friction. • application of friction in daily life. • discover and define the term drag. • appreciate the streamlined bodies of birds and fishes. • correlate the streamlined bodies of birds and fishes with that of aeroplanes and boats.

Home Work / Assignments

- Exercise questions.
- Extra questions
- Worksheets

Teacher's Activity	Student's Activity	Teacher's Observation and Remedial action taken
Teacher will <u>Annexure 12 (A)</u> demonstrate an activity to push a book on the table and explain the Force of Friction <u>Annexure 12 (B) :</u> demonstrate an activity to make an inclined plane and roll a pencil on the table and covered with 3 different types of material <u>Annexure 12 (C) :</u> demonstrate an activity to roll a book on the rollers made out of pencils. <u>Annexure 12 (D) :</u> demonstrate an activity to show that surface in contact affects the force of Friction. <u>Annexure 12 (E) :</u> demonstrate an activity to Sliding and Static Friction using a Spring Balance. explain the ways to increase and decrease friction with the help of ICR and giving examples from daily life. explain Drag-Friction in fluids with the help of ICR	Students will: <u>Annexure 12 (a)</u> perform the same on their tables using their books and experience that it comes to rest <u>Annexure 12 (b)</u> perform the same on their tables and using their experience the cause of force of friction. <u>Annexure 12 (c):</u> perform the same on their tables and experience Rolling Friction. <u>Annexure 12 (d):</u> perform the activity and record the observation in their notebooks. <u>Annexure 12 (e) :</u> perform the activity in pairs with the help of their Activity Kits and record observation one by one. Visit a shoe shop and collect pictures of different types of shoes and paste them in their notebooks. comprehend by giving some examples.	

Teaching Aids – Active Inspire boards, ICR, Materials required for activities, worksheets and textbook, Spring Balance., Activity Kits

Methodology / Innovative Methods: Activity based teaching, Know to Unknown, Discussions, Deductive Activity method, brainstorming sessions.

Interdisciplinary Links – Biology – Streamlined bodies. English- Improves expression and vocabulary.

Maths- Reordering and interpreting readings on Spring balance. Art- Neatness in drawing diagrams

HOD

Coordinator

Vice-Principal

Principal

➤ **ANNEXURE12(A)**

To experience the Force of Friction.

The teacher will take a textbook and keep it on a table. Now ask one of the students to push it from right side and observe. Similarly call another student to push the book from left side and record the observations.

➤ **ANNEXURE12(a)**

Students conclude that a force acts on the book which is opposing its motion. If we apply a force in the right direction it moves towards the left and if we apply the force in left direction it moves towards the right and finally stops due to this opposing force called as friction.

Students will infer that friction opposes relative motion between the surfaces of the book and the table.

Annexure 12(B), 12(b)

ACTIVITY NO. 12 – STOP! STOP!

Subject	Science
Class	VIII
Chapter/Unit	Friction
Topic	Factors affecting friction
Time	30 minutes
Nature of Activity	Group

What will I learn (Learning Outcome)?

Will experimentally evaluate that friction depends on the nature of the surfaces in contact.

Skills: Applying, Evaluating, Analyzing and Creating

What I have to do?

To show that surface in contact affects the force of Friction.

What do I require?

Sunmica sheet, a sand paper sheet, a spring balance, wooden block with a hook and a wooden table.

What do I need to know?

Friction is the force which opposes the relative motion between two surfaces in contact. It is caused by the irregularities on the two surfaces in contact. The more the irregularities between the two surfaces, the more will be the force of friction.

➤ **Teacher's Activity**

Teacher will-

1. explain the factors which affect friction.
2. make arrangements for the activity
3. make pairs of the students and will explain the steps of the activity.
4. ensure that each participant of the pair performs the activity on his/her own.

How will I proceed?

➤ **Student's Activity**

1. Attach the wooden block to the hook of the spring balance.
2. Try to pull the wooden block horizontally on the wooden table first by applying a small force on the spring balance.
3. Now spread the sand paper sheet on the table and place the wooden block on it.
4. Try to pull the wooden block horizontally on the sand paper sheet first by applying a small force on the spring balance.
5. What do you observe?
6. Now increase the force gradually on the spring balance till the block starts sliding.
7. Note the position of the pointer of the spring balance, when the block just starts sliding.
8. Now repeat the steps No.4 and 5 with sunmica sheet.

What have I observed?

Surface of contact	Spring balance reading (g) when Wooden block kept on the large edge	Spring balance reading (g) when Wooden block kept on the small edge
1. Wooden table		
2. Sand paper		
3. Sunmica sheet		

What have I learnt?

- According to the above activity, friction depends on:
 - Nature of the surface in contact- Yes/No
 - Area of contact - Yes/No
- For smooth surfaces, friction is _____. For rough surfaces, friction is _____.

What am I curious to learn?

- Let us perform the following activity-
Interlock the two similar sized books by overlapping the pages. Once your books are fully interlocked each person should hold the book by its cover. Now pull firmly to separate the books. (Remember to check around you to ensure that you won't hit anything in case you fall!) What do you find? Are you able to separate the books?
- Let us perform an activity to show the change in static friction with change in weight of the object.

Let me evaluate myself

- How can we decrease the effect of friction on a body?

- Why is it difficult to walk on a wet floor?

- Name the two surfaces between which friction plays the role in the following cases:-

- A student writes, using a chalk, on a board
- A man turns the lid to open a bottle.

- Why does it become difficult for a rickshaw puller to pull the rickshaw when three people are sitting on it compared with the situation when only one person is sitting on it?

- A marble is allowed to roll down an inclined plane from a fixed height. At the foot of the inclined plane, it moves on a horizontal surface

- covered with silk cloth
- covered with a layer of sand and
- covered with a glass sheet.

On which surface will the marble move the shortest distance. Give reason for your answer.

➤ **ANNEXURE12(C)**

To explain rolling friction, the teacher will demonstrate a simple activity taking a textbook kept on a few pencils aligned one after the other. If the book is pushed over such an arrangement it moves faster than if pushed otherwise.

➤ **ANNEXURE12(c)**

Students will be able to conclude that the rolling friction is smaller than sliding friction and will paste any three examples of Rolling friction from our surroundings.



Annexure 12 (D), 12(d)

Activity - Static friction

Chapter- Friction

Class: VIII

Duration: 30 minutes

Nature of the activity: Group

Learning Outcome: Students will experimentally identify static friction between two objects.

What we have to do?

To show the change in static friction with change in weight of an object.

What do we require?

A wooden block with a hook (a nail can be fixed to the block and used as a hook) tied to a thread, some weights e.g., 50 g, 100 g, 150 g. weighing balance.

What do we need to know?

Friction opposes the state of motion of any object. Static friction is a force that keeps an object at rest. It must be overcome to start a moving object. It depends on the weight of the object.

How do we proceed?

➤ Teacher's activity

Teacher will ask the students to recall the definition of friction and its role in opposing motion and will also guide the students on how to perform the activity.

➤ Student's activity

1. Take the wooden block with the hook.
2. Tie thread to the hook of the wooden block.
3. Attach the wooden block to the hook of the spring balance. Try to pull the block and measure the readings on the spring balance
4. Now put 50 g weight on the block and repeat the same step again. Measure the reading on the spring balance.
5. Now put 100 g weight and 150 g weight one by one and measure the readings on the spring balance.
6. Record your observations in the observation table.

What have we observed?

Mass of the weight placed on the block (g)	Reading on the spring balance (g)
0	
50	
100	
150	

The force required to pull the block increases with the _____ in the weight on the block.

What have we learnt?

According to the above activity, friction depends on the _____.

The interlocking of the irregularities between the surfaces of the block and the table _____ when the surfaces were pressed harder by putting weight on the block. Hence, the static friction increases with the _____ in weight.

What more can we do?

Teacher will guide the students to perform the following activity:

Repeat this activity by wrapping the wooden block first with polythene sheet and then with sheet of paper. Slide the wooden block on the surface of sunmica sheet and sand paper. Compare the results.