

CLASS – VIII
LESSON PLAN
CHAPTER- FRICTION

Unit	Chapter Friction
Class Transaction	Total periods required:7 (approx. 40 min each)
Pre-requisite for the course	This lesson requires Basic knowledge of friction Basic knowledge of the basic terms: Friction, sliding and rolling which students had already learnt in class VI , VII
Assessment of qualifying knowledge	Written test Group Discussion Quiz HW Notebook
Objectives	Given the content (chapter) the learners will be able to describe the terms friction and drag and list advantages and disadvantages of friction in their notebook with 90% accuracy.
	DOL- D1, D2, D3, D4
Learning Outcomes	<u>Knowledge-</u> <i>Students will know and understand</i> • What is friction • What are the causes and effects of friction. • What is drag? • What are the methods to increase or reduce friction? <u>Skills & Competencies-</u> Students would be able to • Critically analyse the relation between static rolling and sliding friction. • Appreciate the importance of friction. Collaboratively • Design Creative methods to bring a positive change in the life style by increasing or reducing friction. Built character amongst themselves by discussing /communicating the importance of friction in their daily life. Answer knowledge, understanding, application and diagrammatic skill based questions based on the topic. Attitudes and beliefs- <i>Students will be able to</i> Develop citizenship by visualizing and observing day to day phenomena and present it in form of a skit to sensitize others
Transaction Methodology (Approaches, Strategies, Tools	Transaction would proceed in the following manner- Active learning- Fan-N-Pic on friction. (Critical thinking) Group learning- The class will be divided in the group of 5 students. <i>Circle</i>

and Techniques) Facilitation	<i>the Sage</i>- The question will be asked by the teacher about the friction and its type who knows the answer will stand at the various corners of the room. (Communication, Collaboration) Differentiation- The students in a group of 10 will be demonstrating the effect of friction (Character, Citizenship) Questioning- <i>Multiple level question</i>- Teacher will prepare a list of question about the frictional force and will ask these questions during discussions. (Critical thinking, Communication) Brain Storming-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. Introduction of the topic- PPT and Digital Content would be shared Facilitation of content The facilitator will enable the learners to understand the fundamental concept of friction He will compare and contrast the different kinds of frictional forces. Approaches The facilitator should apply some or all of the approaches while administering the teaching learning process • Didactic approach • Summarizing approach • Feedback approach Techniques to be used: • Quiz • MCQ • PPT • Computer aided simulation/3D pictures • Skit/Role playing • Group discussion • HOTS questions • Peer Assessment • Lab Activities <i>Guided practice to be followed by Independent Practice</i>- NCERT questions to be discussed in the classroom.
Resources	Text Book: NCERT text book

	Reference Books CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W note books as mentioned in the monthly planner by which we can assess their critical thinking and creativity HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 Rubrics On time submission.....1 mark Presentation/ Neatness.....1 mark Content (critical thinking and creativity).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Assessments	4 UNIT TESTS25 Mark each=100 Marks HALF YEARLY EXAMINATION 80+20 (internal)=100 Marks ANNUAL EXAMINATION 80+20(internal)=100 Marks By administering pen paper test, we assess creativity and critical thinking. INTERNAL ASSESSMENT 20 Marks in each Term • Subject Enrichment Activity 10 Marks With the help of subject enrichment activities we assess communication, collaboration, character building and citizenship (Demonstration and implementation of on force and pressure in our daily life). The students in a group of 5 will be demonstrating the activity. • Note Book Submission 10 Marks
Addressing Classroom Diversity	It's a different classroom today: As the kids are from different socio-economic background, So are their needs, demands and aspirations. Today all kinds of students including the gifted, the average and the differently able are mainstreamed into one class. So, the teaching learning process must be devised in such that can cater to the needs and aspirations of students of abilities . The following techniques can be used for different groups: <i>For the gifted:</i> • Preparing a debate • Making PPT

	• Designing an exhibit • Writing a report • Preparing a talk • Encouragement for referring other resources <i>For the average/slow learners:</i> • Making a Chart/diagram/poster/ flashcards • Buddy system help to be provided • Provide grade-up classes <i>For differently able:</i> • Ignore grammatical inaccuracy • Call parents at regular intervals • Provide grade-up classes
Marks	The weightage would be given by CBSE.
	Q 1 Why is it easier to pull luggage fitted with rollers? Q 2 What is the role of brake pads in the brake system of bicycles or automobiles? Q 3 Why is the wheel said to be the greatest invention of mankind? Q 4 We find it difficult to move on ice or on a very smooth polished floor. Q 5 Give reasons i) Rolling friction is less than sliding friction. ii) A matchstick light when we strike it on a rough surface.

Unit	Day 1 (Cause of friction)
Class Transaction	approx. 40 min
Pre-requisite for the course	This lesson requires Basic knowledge of friction Basic knowledge of the basic terms: Friction, sliding and rolling which students had already learnt in class VI ,VII
Assessment of qualifying knowledge	Written test Group Discussion Quiz HW Notebook
Objectives	Given the content (chapter) the learners will be able to describe the terms friction and its cause with 90% accuracy.
	DOL- D1, D2
Learning Outcomes	<u>Knowledge-</u> <i>Students will know and understand</i> • What is friction • What are the causes and effects of friction. <u>Skills & Competencies-</u> Students would be able to • Critically analyse the cause of friction. Attitudes and beliefs- <i>Students will be able to</i> Develop citizenship by visualizing and observing day to day phenomena and present it in form of a skit to sensitize others
Transaction Methodology (Approaches, Strategies, Tools and Techniques)	Transaction would proceed in the following manner-
Facilitation	Questioning- Multiple <i>level question</i>- Teacher will prepare a list of question about the frictional force and will ask these questions during discussions. (Critical thinking, Communication) <i>Brain Storming</i>-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic</i>- PPT and Digital Content would be shared Facilitation of content The facilitator will enable the learners to understand the fundamental concept of friction He will compare and contrast the different kinds of frictional forces. Approaches The facilitator should apply some or all of the approaches while

	administering the teaching learning process • Didactic approach • Summarizing approach • Feedback approach Techniques to be used: • Quiz • MCQ • PPT • Computer aided simulation/3D pictures • Skit/Role playing • Group discussion • Peer Assessment • Lab Activities <i>Guided practice to be followed by Independent Practice-</i> NCERT questions to be discussed in the classroom.
Resources	Text Book: NCERT text book Reference Books CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W note books as mentioned in the monthly planner by which we can assess their critical thinking and creativity HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 Rubrics On time submission.....1 mark Presentation/ Neatness.....1 mark Content (critical thinking and creativity).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Closure	Involving students in summarizing by asking them to prepare questions based on the topic.
Unit	Day 2 (factors affecting friction)
Class Transaction	approx. 40 min

Pre-requisite for the course	This lesson requires Basic knowledge of friction Basic knowledge of the basic terms: Friction, sliding and rolling which students had already learnt in class VI, VII
Assessment of qualifying knowledge	Written test Group Discussion Quiz HW Notebook
Objectives	Given the content (chapter) the learners will be able to describe the factors affecting friction in their notebook with 90% accuracy.
	DOL- D2, D3
Learning Outcomes	<u>Knowledge-</u> <i>Students will know and understand</i> • What are the causes and effects of friction. • What are the methods to increase or reduce friction? <u>Skills & Competencies-</u> Students would be able to • Critically analyse the factors affecting friction. Attitudes and beliefs- <i>Students will be able to</i> Develop citizenship by visualizing and observing day to day phenomena and present it in form of a skit to sensitize others
Transaction Methodology (Approaches, Strategies, Tools and Techniques) Facilitation	Transaction would proceed in the following manner- Questioning- Multiple <i>level question-</i> Teacher will prepare a list of question about the frictional force and will ask these questions during discussions. (Critical thinking, Communication) <i>Brain Storming-</i>The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic-</i> PPT and Digital Content would be shared Facilitation of content The facilitator will enable the learners to understand the fundamental concept of friction He will compare and contrast the factors affecting friction. Approaches The facilitator should apply some or all of the approaches while administering the teaching learning process

	• Didactic approach • Summarizing approach • Feedback approach Techniques to be used: • Quiz • MCQ • PPT • Computer aided simulation/3D pictures • Skit/Role playing • Group discussion • HOTS questions • Peer Assessment • Lab Activities <i>Guided practice to be followed by Independent Practice-</i> NCERT questions to be discussed in the classroom.
Resources	Text Book: NCERT text book Reference Books CBSE Exemplar
Self-Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W note books as mentioned in the monthly planner by which we can assess their critical thinking and creativity HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 Rubrics On time submission.....1 mark Presentation/ Neatness.....1 mark Content (critical thinking and creativity).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Closure	Involving students in summarizing by asking them to prepare questions based on the topic.

Unit	Day 3 (Types of friction)
Class Transaction	approx. 40 min
Pre-requisite for	This lesson requires

the course	Basic knowledge of friction Basic knowledge of the basic terms: Friction, sliding and rolling which students had already learnt in class VI, VII
Assessment of qualifying knowledge	Written test Group Discussion Quiz HW Notebook
Objectives	Given the content (chapter) the learners will be able to describe the terms friction and explain type of friction notebook with 90% accuracy.
	DOL- D2, D3
Learning Outcomes	<u>Knowledge-</u> <i>Students will know and understand</i> • What is friction • What are the types of friction. <u>Skills & Competencies-</u> Students would be able to • Critically analyse the relation between static rolling and sliding friction. Attitudes and beliefs- <i>Students will be able to</i> Develop citizenship by visualizing and observing day to day phenomena and present it in form of a skit to sensitize others
Transaction Methodology (Approaches, Strategies, Tools and Techniques)	Transaction would proceed in the following manner-
Facilitation	Group learning- The class will be divided in the group of 5 students. <i>Circle the Sage-</i> The question will be asked by the teacher about the friction and its type who knows the answer will stand at the various corners of the room. (Communication, Collaboration) <i>Brain Storming-</i>The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic-</i> PPT and Digital Content would be shared Facilitation of content The facilitator will enable the learners to understand the fundamental concept of friction He will compare and contrast the different kinds of frictional forces. Approaches The facilitator should apply some or all of the approaches while

	administering the teaching learning process • Didactic approach • Summarizing approach • Feedback approach Techniques to be used: • Quiz • MCQ • PPT • Computer aided simulation/3D pictures • Skit/Role playing • Group discussion • HOTS questions • Peer Assessment • Lab Activities <i>Guided practice to be followed by Independent Practice- NCERT questions to be discussed in the classroom.</i>
Resources	Text Book: NCERT text book Reference Books CBSE Exemplar
Self-Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W note books as mentioned in the monthly planner by which we can assess their critical thinking and creativity HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 Rubrics On time submission.....1 mark Presentation/ Neatness.....1 mark Content (critical thinking and creativity).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Closure	Involving students in summarizing by asking them to prepare questions based on the topic.

Unit	Day 4 (Advantage of friction)
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Class Transaction	approx. 40 min
Pre-requisite for the course	This lesson requires Basic knowledge of friction Basic knowledge of the basic terms: Friction, sliding and rolling which students had already learnt in class VI ,VII
Assessment of qualifying knowledge	Written test Group Discussion Quiz HW Notebook
Objectives	Given the content (chapter) the learners will be able to describe and list advantages of friction in their notebook with 90% accuracy.
	DOL- D3, D4
Learning Outcomes	<u>Knowledge-</u> <i>Students will know and understand</i> • What is friction • What are the causes and effects of friction. • What are the methods to increase or reduce friction <u>Skills & Competencies-</u> Students would be able to • the importance of friction. Collaboratively Attitudes and beliefs- <i>Students will be able to</i> Develop citizenship by visualizing and observing day to day phenomena and present it in form of a skit to sensitize others
Transaction Methodology (Approaches, Strategies, Tools and Techniques)	Transaction would proceed in the following manner-
Facilitation	Differentiation- The students in a group of 10 will be demonstrating the effect of friction (Character, Citizenship) <i>Introduction of the topic-</i> PPT and Digital Content would be shared Facilitation of content The facilitator will enable the learners to understand the fundamental concept of friction He will compare and contrast the different kinds of frictional forces. Approaches The facilitator should apply some or all of the approaches while administering the teaching learning process • Didactic approach

	• Summarizing approach • Feedback approach Techniques to be used: • Quiz • MCQ • PPT • Computer aided simulation/3D pictures • Skit/Role playing • Group discussion • HOTS questions • Peer Assessment • Lab Activities <i>Guided practice to be followed by Independent Practice-</i> NCERT questions to be discussed in the classroom.
Resources	Text Book: NCERT text book Reference Books CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W note books as mentioned in the monthly planner by which we can assess their critical thinking and creativity HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 Rubrics On time submission.....1 mark Presentation/ Neatness.....1 mark Content (critical thinking and creativity).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Closure	Involving students in summarizing by asking them to prepare questions based on the topic.

Unit	Day 5 (Disadvantages of friction)
Class Transaction	approx. 40 min

Pre-requisite for the course	This lesson requires Basic knowledge of friction Basic knowledge of the basic terms: Friction, sliding and rolling which students had already learnt in class VI ,VII
Assessment of qualifying knowledge	Written test Group Discussion Quiz HW Notebook
Objectives	Given the content (chapter) the learners will be able to describe the disadvantages of friction in their notebook with 90% accuracy.
	DOL- D1, D2, D3
Learning Outcomes	<u>Knowledge-</u> <i>Students will know and understand</i> • What is friction • What are the causes and effects of friction. • What are the methods to increase or reduce friction <u>Skills & Competencies-</u> Students would be able to • Design Creative methods to bring a positive change in the life style by increasing or reducing friction. Attitudes and beliefs- <i>Students will be able to</i> Develop citizenship by visualizing and observing day to day phenomena and present it in form of a skit to sensitize others
Transaction Methodology (Approaches, Strategies, Tools and Techniques) Facilitation	Transaction would proceed in the following manner- Active learning- Fan-N-Pic on friction. (Critical thinking) Group learning- The class will be divided in the group of 5 students. <i>Circle the Sage-</i> The question will be asked by the teacher about the friction and its type who knows the answer will stand at the various corners of the room. (Communication, Collaboration) Differentiation- The students in a group of 10 will be demonstrating the effect of friction (Character, Citizenship) Questioning- <i>Multiple level question-</i> Teacher will prepare a list of question about the frictional force and will ask these questions during discussions. (Critical thinking, Communication) Brain Storming-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. Introduction of the topic- PPT and Digital Content would be shared

	Facilitation of content The facilitator will enable the learners to understand the fundamental concept of friction He will compare and contrast the different kinds of frictional forces. Approaches The facilitator should apply some or all of the approaches while administering the teaching learning process • Didactic approach • Summarizing approach • Feedback approach Techniques to be used: • Quiz • MCQ • PPT • Computer aided simulation/3D pictures • Skit/Role playing • Group discussion • HOTS questions • Peer Assessment • Lab Activities <i>Guided practice to be followed by Independent Practice-</i> NCERT questions to be discussed in the classroom.
Resources	Text Book: NCERT text book Reference Books CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W note books as mentioned in the monthly planner by which we can assess their critical thinking and creativity HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 Rubrics On time submission.....1 mark Presentation/ Neatness.....1 mark Content (critical thinking and creativity).....3 marks It is also advised that the students come to the class with proper

	background knowledge of the topic under discussion. They can refer to the resources stated above.
Closure	Involving students in summarizing by asking them to prepare questions based on the topic.
Unit	Day 6 (Methods of increasing and decreasing friction)
Class Transaction	approx. 40 min
Pre-requisite for the course	This lesson requires Basic knowledge of friction Basic knowledge of the basic terms: Friction, sliding and rolling which students had already learnt in class VI ,VII
Assessment of qualifying knowledge	Written test Group Discussion Quiz HW Notebook
Objectives	Given the content (chapter) the learners will be able to describe the terms friction and explain methods of increasing and decreasing friction in their notebook with 90% accuracy.
	DOL- D2, D3
Learning Outcomes	Knowledge- Students will know and understand • What is friction • What are the causes and effects of friction. • How can we increase and decrease friction? Skills & Competencies- Students would be able to • Design Creative methods to bring a positive change in the life style by increasing or reducing friction. Built character amongst themselves by discussing /communicating the importance of friction in their daily life. Attitudes and beliefs- Students will be able to Develop citizenship by visualizing and observing day to day phenomena and present it in form of a skit to sensitize others
Transaction Methodology (Approaches, Strategies, Tools and Techniques)	Transaction would proceed in the following manner- Differentiation- The students in a group of 10 will be demonstrating the effect of friction (Character, Citizenship) Brain Storming-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic

Facilitation	that they would be studying. Introduction of the topic- PPT and Digital Content would be shared Facilitation of content The facilitator will enable the learners to understand the fundamental concept of friction He will compare and contrast the different kinds of frictional forces. Approaches The facilitator should apply some or all of the approaches while administering the teaching learning process • Didactic approach • Summarizing approach • Feedback approach Techniques to be used: • Quiz • MCQ • PPT • Computer aided simulation/3D pictures • Skit/Role playing • Group discussion • HOTS questions • Peer Assessment • Lab Activities Guided practice to be followed by Independent Practice- NCERT questions to be discussed in the classroom.
Resources	Text Book: NCERT text book Reference Books CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W note books as mentioned in the monthly planner by which we can assess their critical thinking and creativity HW notebooks to be marked as per the given plan: Assessment Parameters: The total marks for the activity is 5 Rubrics On time submission.....1 mark Presentation/ Neatness.....1 mark

	Content (critical thinking and creativity).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Closure	Involving students in summarizing by asking them to prepare questions based on the topic.

Unit	Day 7
Class Transaction	approx. 40 min
Pre-requisite for the course	This lesson requires Basic knowledge of friction Basic knowledge of the basic terms: Friction, sliding and rolling which students had already learnt in class VI ,VII
Assessment of qualifying knowledge	Written test Group Discussion Quiz HW Notebook
Objectives	Given the content (chapter) the learners will be able to describe the terms friction and drag and explain the factors on which drag depends in their notebook with 90% accuracy.
	DOL- D2, D3
Learning Outcomes	<u>Knowledge-</u> <i>Students will know and understand</i> • What is friction • What are the causes and effects of friction. • What is drag? On which factors drag depends. • What are the methods to increase or reduce friction? <u>Skills & Competencies-</u> Students would be able to • Critically analyse the drag and the factors on which drag depends • Appreciate the importance of friction. Collaboratively Attitudes and beliefs- <i>Students will be able to</i> Develop citizenship by visualizing and observing day to day phenomena and present it in form of a skit to sensitize others
Transaction Methodology (Approaches, Strategies, Tools and Techniques)	Transaction would proceed in the following manner- Questioning- Multiple <i>level question-</i> Teacher will prepare a list of question about the frictional force and will ask these questions during discussions. (Critical thinking, Communication)

Facilitation	Brain Storming-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. Introduction of the topic- PPT and Digital Content would be shared Facilitation of content The facilitator will enable the learners to understand the fundamental concept of friction He will compare and contrast the different kinds of frictional forces. Approaches The facilitator should apply some or all of the approaches while administering the teaching learning process • Didactic approach • Summarizing approach • Feedback approach Techniques to be used: • Quiz • MCQ • PPT • Computer aided simulation/3D pictures • Skit/Role playing • Group discussion • Case Studies • Talks • HOTS questions • Map work • Peer Assessment • Lab Activities <i>Guided practice to be followed by Independent Practice</i>- NCERT questions to be discussed in the classroom.
Resources	Text Book: NCERT text book Reference Books CBSE Exemplar
Self-Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W note books as mentioned in the monthly planner by which we can assess their critical thinking and creativity

	HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 Rubrics On time submission.....1 mark Presentation/ Neatness.....1 mark Content (critical thinking and creativity).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
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