



Master Lesson Plan

For

Friction

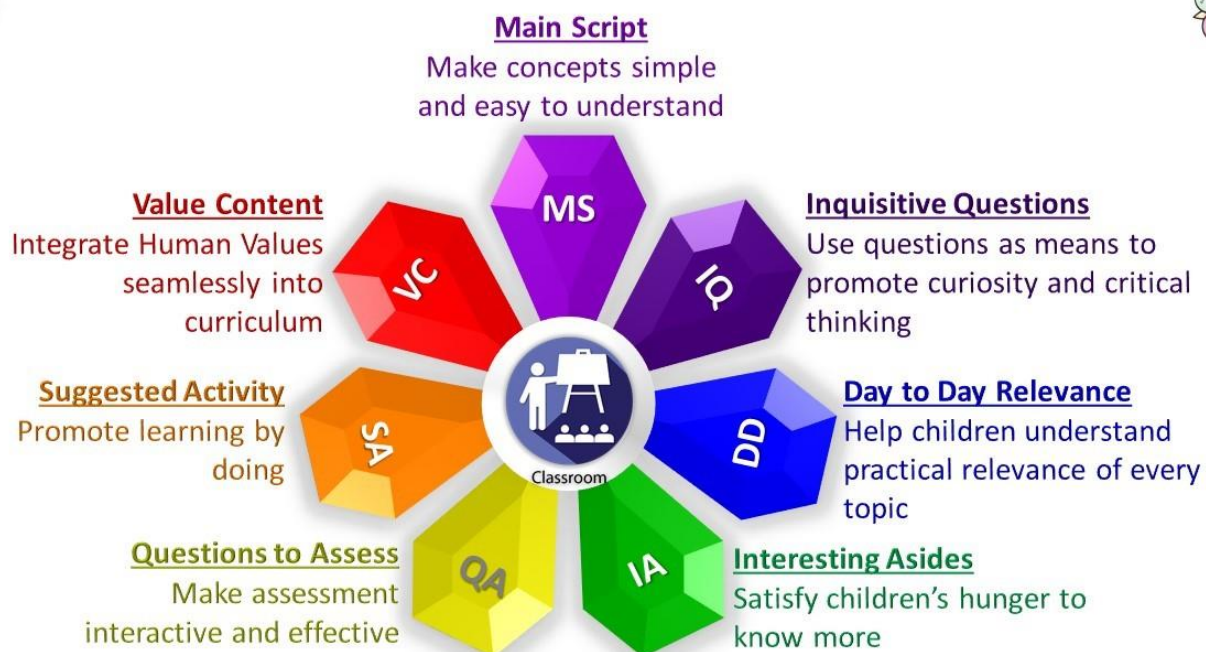
Board	Standard	Subject	Chapter	Language	Reference Link	Creation
CBSE	STD VIII	Science	Friction	English	Friction	2020-11

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Master Lesson Plan (MLP) - Covers the entire chapter with the help of these 7 asset types



For more information on how to use the lesson plan effectively, please scroll to the guidelines at the end of this document.

Friction

1. MS_ Objectives_ Friction

Notes to the teacher: This asset lays down the proposed plan for transacting this chapter. It states the asset objectives of the MLP. This asset is for teacher's reference and need not be taught to the students:

Students will be able to...

- infer the concepts of friction
- explain friction and the factors affecting friction
- demonstrate the factors affecting friction through a couple of activities
- explore some interesting aspects of shape affecting friction
- show friction between two surfaces
- conclude how friction is advantageous and disadvantageous sometimes show
- how ball bearing reduces friction
- sustain their interest in knowing the negative effects of friction
- explain the common methods to increase and reduce friction
- relish the interesting information on how frictional force is measured
- identify the different types of frictional forces
- recognise friction in common things that we see and use in our daily life
- develop love and forgiveness
- recall the concepts of frictional force

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Main Script	Friction	

2. IQ_ Friction Force

[Notes to the teacher - Teacher may enable the students to think and come out with as many answers as possible before giving out the right answer/ answers]

1. Why do we slip when we step on a banana skin?



Answer: The sliding friction is very low allowing our legs to slide faster than normal and that is the reason why we slip when we step on a banana skin. The surface of the skin of a banana is very smooth and therefore, it presents very low friction.

2. Is there any friction between the bow and string while playing a violin?

Answer: Yes, there is a sliding friction that prevents the sliding movement of the bow on the string. Therefore the player puts rosin, a type of resin, that reduces the sliding friction to the desired level and helps the musician play his instrument.

3. When there is friction, does energy get released?

Answer: Yes. When two objects rub against each other, there is some loss of energy which is transformed to heat energy.

4. What is the difference between abrasion and friction?

Answer: Abrasion is the process of removing material by use of friction. Abrasion cannot happen without friction.

5. Why does a ball stop rolling after sometime?

Answer: When the ball rolls on the ground, there is friction that is presented by the ground to hinder its motion. As the ball rolls, its momentum is lost because of this friction and comes to a stop eventually.

6. Why do the shoe soles have patterns?

Answer: The patterns at the shoe soles provide needed grip / increased friction while walking. If they are not present, then we would slip while walking, just as we do when we step on banana skin.

Image Source:

<https://pixabay.com/photos/accident-injury-risk-banana-peel-994007/>

<https://pixabay.com/vectors/violin-instrument-bow-music-305522/>

<https://pixabay.com/photos/shoe-sole-batch-print-footprint-528004/>

Time to teach	Asset Type	Theme	Sub Theme
7 Minutes	Inquisitive Questions	Friction	Frictional force

3. MS_ What is friction

What is friction?

Friction is a force which works against the motion of objects that are in contact as they move past each other.

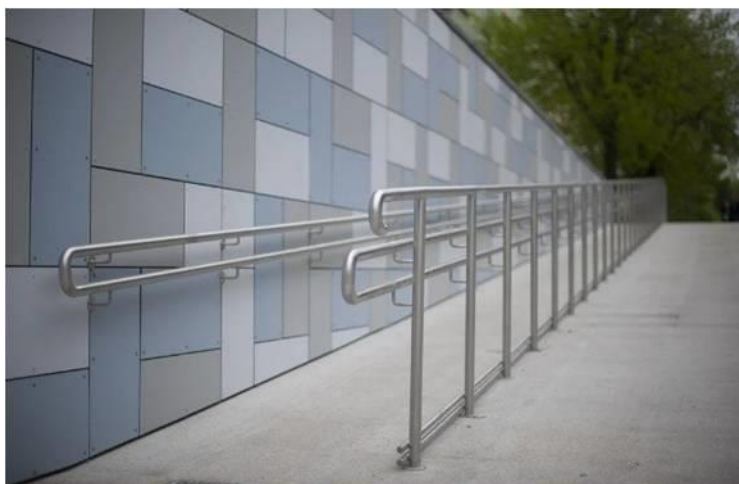
Friction is the resistance offered to the movement of one body over another body with which it is in contact. It opposes the relative motion between two objects.

The force that acts between a moving object and the surface on which it moves is called frictional force.

Friction always acts in a direction opposite to the direction of motion of the object. Friction between different surfaces is different.

Depending on the purpose, frictional force must be increased or decreased.

For example, the ramps or slopes in railway stations are made rough so that people do not slip while walking.



On the other hand, the surface of slides found in parks is smooth so that there is less friction. This enables the children to slide easily, making it enjoyable to play.



Again, the ramp in a bowling arena is smooth so that the ball can roll easily.



The factors affecting friction are as follows:

1) The surface on which the object is moving. If the surface has more crevices and bumps, we must apply a large amount of force to overcome the force of friction.



2) The speed with which the object is moving. If the object is moving with some speed, then the time available for the locking of the contact points is less, and therefore, the friction is less.



3) It depends on the hardness with which two surfaces in contact are pressed against each other.



Image source:

Original Contribution - puttyrevankar@gmail.com

<https://pixabay.com/photos/bowling-bowler-pins-ball-alley-696132/>

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<https://pixabay.com/photos/motorcycle-racing-motorcycle-race-58028/>

<https://pixabay.com/photos/wheels-spin-drift-speed-racing-car-2685039/>

<https://pixabay.com/vectors/lighting-fire-sticks-primitive-36545/>

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Main Script	Friction	Frictional force, Factors affecting Frictional force

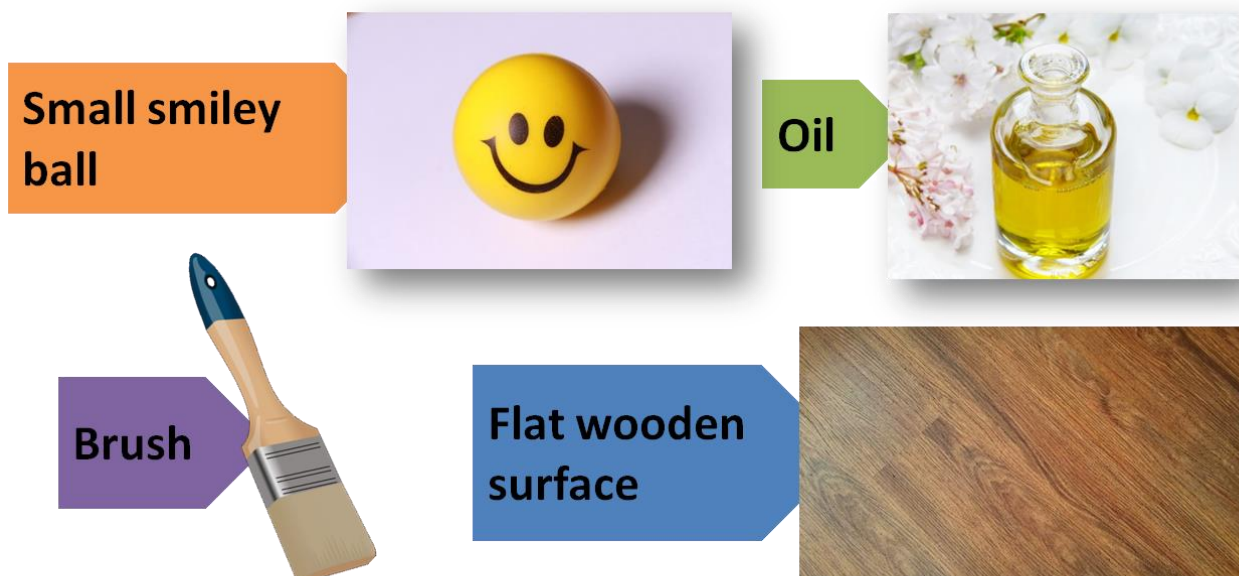
4. SA_ Factors Affecting Friction

Activity 1:

Aim: To understand smoothness as a factor that affects friction.

Class setting: Pair of two students in a group.

Materials required: Small smiley ball, oil, brush, wooden surface.

**Procedure:**

1. Roll the ball on the flat surface and observe how fast it rolls.
2. Using a brush, coat oil on a wooden surface and roll the ball. Observe how fast it rolls.

Observations:

The ball rolls faster on the oil coated surface because of the smoothness that offers less friction on rolling.

Conclusion: The students will be able to understand that smoothness affects friction.

Discussion Points:

1) Why does the ball roll fast on the surface coated with oil ?

Answer: The ball rolls faster on the surface coated with oil because of the smoothness it offers.

2) What is the kind of factor that affected the friction in the above experiment?

Answer: Smoothness, that has decreased the friction between the ball and the surface.

Activity 2:

Aim: To understand weight as a factor that affects friction.

Class setting: Pair of two students in a group.

Materials required: Shot put ball, oil, brush, wooden surface.

**Procedure:**

On a smooth surface, roll the heavy weight shot put ball across the board.

Observations:

The heavy ball covers less distance when compared with the smiley ball that was used in the previous exercise. This is because of its weight. Weight is another factor that affects friction. In this example, the frictional force experienced by the ball becomes higher because of its weight hence it is not able to travel farther.

Conclusion: The students will be able to understand that weight affects friction.

Discussion Points:

1) Why is there a difference between the distance covered by a heavy ball and the smiley ball?

Answer: There is a difference in the distance caused by their weight.

2) What is the factor that affected the friction in the above experiment?

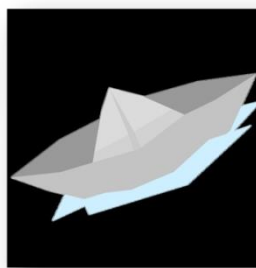
Answer: Weight of the material, that has increased the friction between the ball and the surface.

Activity 3:

Aim: To understand the shape factor that affects friction.

Class setting: Pair of two students in a group.

Materials required: A piece of paper rounded into a ball, a paper boat, a big tub with water.

**Paper Ball****Tub with water****Paper Boat****Procedure:**

Push the paper ball and the paper boat on the tub of water and observe the distance covered by both.

Observations:

The paper boat would seem to move slightly faster than that of the rolled piece of paper and this is because, the shape of the paper boat aids in reducing the frictional force that opposes its motion. This is also the reason behind the designs of boats and ships so that the design aids in their motion.

Conclusion: The students will be able to understand that shape affects friction.

Discussion Points:

1) How does the paper boat move faster than that of the rolled piece of paper?

Answer: The shape of the paper boat aids its faster movement.

2) What is the kind of factor that affected the movement of the two different types of paper toys in the above experiment?

Answer: Shape of the Object.

Precautions: Be careful not to spill oil on the floor.

Image Source:

Smiley Ball: <https://www.flickr.com/photos/42216816@N08/8634670769> - CC BY 2.0 - Sébastien Gagnon

Oil: <https://pixabay.com/photos/glass-bottle-oil-wellness-flowers-4108085/>

<https://pxhere.com/en/photo/915266>

Brush: <https://freesvg.org/cyberscooty-pinceau-peinture>

Shotput Ball: <https://www.flickr.com/photos/ftmeade/19559739901/> - CC BY 2.0 - Fort George G. Meade Public Affairs Office

Paper ball: <https://pixabay.com/photos/paper-ball-crumpled-paper-ball-map-1926031/>

Paper Boat: <https://www.goodfreephotos.com/vector-images/paper-boat-vector-clipart.png.php>

Tub: <https://pixabay.com/vectors/bucket-water-tub-container-pail-159476/>

Time to teach	Asset Type	Theme	Sub Theme
20 Minutes	Suggested Activity	Friction	Kinds of friction, Causes of friction

5. IQ_ How does shape affect friction?

[Notes to the teacher - Teacher may enable the students to think and come out with as many answers as possible before giving out the right answer/ answers]

1. Do fish see resistance when they swim?



Answer: Yes. They experience fluid friction.

2. Do birds experience friction when they fly up in the sky?



Answer: Yes. They experience fluid friction.

3. Does an airplane flying in the air face friction?



Answer: Yes, air planes also experience fluid friction.

4. Why is an airplane designed like a bird to fly high?

Answer: The body of a bird or airplane has a streamlined body. This is because the shape does not present much resistance while moving through air. That is why flights are able to travel at increased speed because of the shape whereas a parachute or a kite can only glide slowly.

Similarly, the shape of a fish presents less resistance while moving through water. That is why they are able to swim fast. Also, the reason why swimmers assume a shape similar to that of a fish is to be able to swim fast.

5. Why are tyres circular in shape?



Answer: Tyres are circular in shape as they offer less friction and enable rolling motion. Any other shape such as square or triangular shape would not suit the need for rolling motion.

Image source:

Fish: <https://pixabay.com/photos/puffer-fish-fish-4068750/>

Bird: <https://pixabay.com/photos/hummingbird-bird-trochilidae-flying-2139279/>

Airplane: <https://www.publicdomainpictures.net/en/view-image.php?image=254412&picture=airplane-sunset-travel>

Tyres: <https://pixabay.com/photos/tires-car-tyres-garbage-recycling-3843108/>

Time to teach	Asset Type	Theme	Sub Theme
7 Minutes	Inquisitive Questions	Friction	Factors affecting friction,

6. SA_ Friction between two surfaces

Aim: To show friction through a small activity.

Class setting: Pair of two students in a group.

Materials required: A table, a flat wooden surface

Procedure:

1. The students should push the book across the table.

2. Observe the distance where the book comes to a stop, from its start position. Note down the same.

Observation:

After being pushed, the book travels some distance and comes to a halt. This is because of the force that acts on the book against its motion. This force is called friction.

Conclusion: The students will be able to understand what friction is.

Discussion Points:

1) Why does the book not continue to move?

Answer: The book does not continue to move because of the force that acts on the book against its motion.

2) Why does the book start moving initially?

Answer: The book started moving initially because the external force that acted on the book was greater than the frictional force. This is essential for the object to start moving.

3) What is frictional force?

Answer: Frictional force is a force that occurs between two moving objects thereby opposing the motion.

Time to teach	Asset Type	Theme	Sub Theme
10 Minutes	Suggested Activity	Friction	Kinds of friction, Frictional force, Causes of friction

7. MS_ Friction - Friend and Foe

Even though friction causes much damage like wear and tear in machinery parts etc., some tasks cannot be performed without friction, like writing, running etc. Therefore, friction can be aptly termed a necessary evil because it acts like both a friend and a foe.

Friction is a friend because –

- It allows us to walk comfortably.



- It allows us to grip and hold objects.



- Objects do not move from their place because of friction.



- Speed of moving objects can be controlled due to friction.

A teacher is able to write on the blackboard because of friction.



Friction is a foe because –

- It causes wear and tear in objects of our daily use such as in washing machines, grinder, doors and soon. Hence their maintenance becomes expensive sometimes. Much money is wasted in repairing the damaged parts.
- Moving heavy objects becomes difficult because of friction.

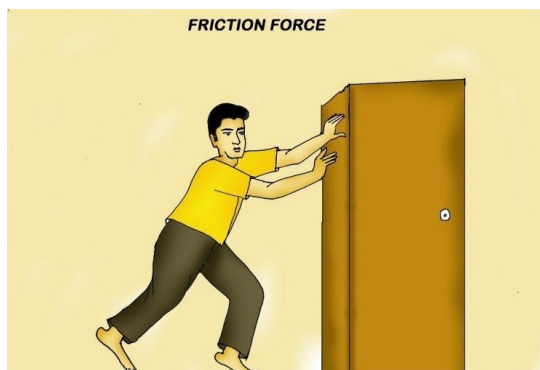


Image source:

All Images : SSSVV Gallery

Time to teach	Asset Type	Theme	Sub Theme
3 Minutes	Main Script	Friction	Disadvantages of friction, Advantages of friction

8. SA_ Ball bearing and friction

Aim: To show how ball bearing reduces friction.

Materials required: Two small round light weight metallic trays, marbles, one or two pickle jars.

Procedure:

1. Spread the marbles on one tray.
2. Place the other tray on top of the marbles.
3. Place the pickle jars on top of the top tray.

Observation:

The top tray tries to move on top of the bottom one. The marbles aid in that motion by reducing the friction between the two. They act as ball bearings, thus reducing the rotational friction.

Inference: The students will be able to understand how ball bearing reduces friction



Discussion Points:

1. How does ball bearing help reduce friction?

Answer: The ball bearings aid in the movement of the top tray over the bottom one, thus reducing the friction between them.

2. What kind of friction is reduced?

Answer: Rotational friction is reduced.

Precaution: Take care not to drop any of these items on the floor.

Image source: Original contribution - rushmish@gmail.com

Time to teach	Asset Type	Theme	Sub Theme
20 Minutes	Suggested Activity	Friction	Frictional force, Factors affecting Frictional force

9. IA_ Friction and its negative effects

In any type of vehicles such as a car, boat, or airplane, excess friction means that extra fuel must be used to power the vehicle. In other words, fuel or energy is being wasted because of friction.

The Law of Conservation of Energy states that the amount of energy remains constant. Thus, the energy that is "lost" to friction in trying to move an object is really converted to heat energy. The friction of parts rubbing together creates heat.



We have seen how people start fire by vigorously rubbing two sticks together. These are examples of friction creating heat energy. Just rub your hands together to create the same effect. Besides the problem of losing energy to heat, there is also the threat of a part over heating due to friction. This can cause damage to a machine.

Even though friction is not visible, it can cause great losses.



When a spacecraft enters the earth's atmosphere with great speed, due to friction with air molecules, heat is generated, and the amount of heat is so high that the space craft catches fire and starts burning.

Image source:

SSSVV Gallery

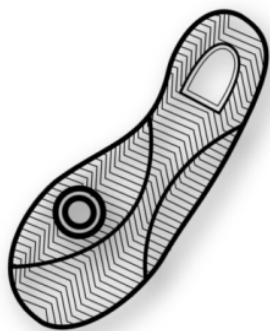
<https://pixabay.com/photos/challenger-space-shuttle-launch-1102029/>

Time to teach	Asset Type	Theme	Sub Theme
3 Minutes	Interesting Asides	Friction	Disadvantages of friction

10. MS_ Increasing and Reducing Friction

Increasing Friction:

Friction can be a friend or a foe. While walking we need friction otherwise we would slip on the floor. This is the reason why there are grooves on the shoes that provide the required friction while we walk.



Friction is increased by using breaking pads in the brake system of bicycles and automobiles. When the vehicle is in motion, the breaking pads do not come in contact with the rotating wheels. When the vehicle has to be halted, the driver applies the brakes, and the braking pads come in contact with the wheels, thus halting the vehicle.



Similarly, the doors that we open and close in our houses have the required friction and that is why they are able to swing through when pushed or pulled, and they come to a halt to stay shut or to stay open.



Reducing Friction:

There are situations where the friction has to be reduced. In the same example of opening the door, if the friction is too high, then we would face problems in swinging the door open. To reduce the friction, one can apply oil on the hinges which reduces the friction thus enabling easy movement of the door.



While playing carrom, one applies talcum powder to reduce the friction on the carrom board so that coins slide freely on the board.



These substances that help reduce the friction are called lubricants. These lubricants form a thin layer between the moving parts because of which the moving parts do not come in contact with each other that often, thus reducing the friction.

Lubricants have to be selected based on the material of the moving objects between which friction has to be reduced. For example, one cannot apply oil on a carrom board to reduce friction. Similarly, applying talcum powder on door hinges will not reduce friction either.

Image source:

<https://pixabay.com/vectors/shoe-sole-print-footwear-profile-295444/>

<https://pixabay.com/illustrations/door-open-door-wooden-door-1202905/>

<https://pixabay.com/photos/motorcycle-race-motorsport-480440/>

SSSVV Gallery

Time to teach	Asset Type	Theme	Sub Theme
8 Minutes	Main Script	Friction	Increasing and reducing friction

11. IA_ Measure Friction

Can you measure friction?

- A tribometer is an instrument that measures friction on a surface.
- A profilograph is a device used to measure pavement surface roughness.

Spring balance is used to measure the force acting on a body.

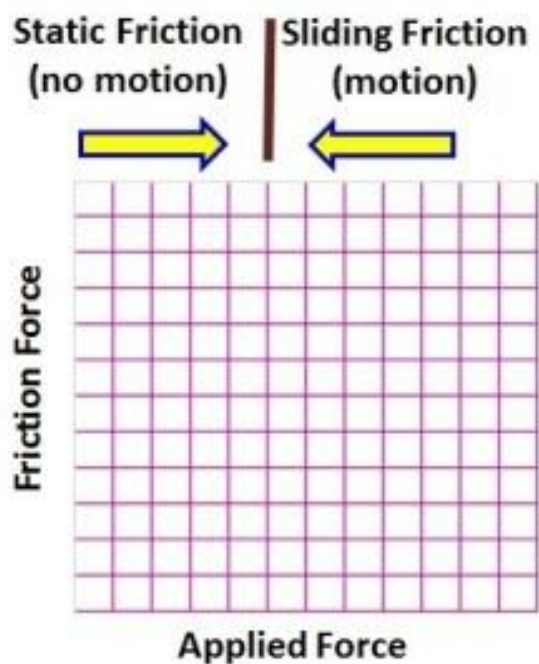
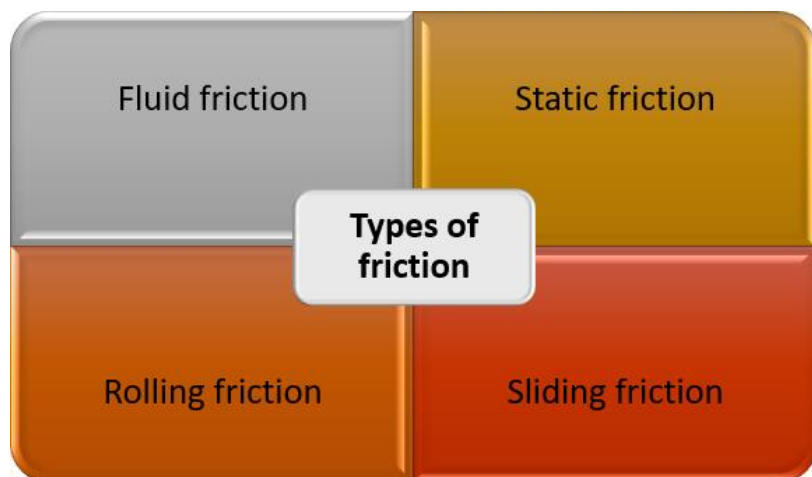


Image Source: SSSVV Gallery

Time to teach	Asset Type	Theme	Sub Theme
3 Minutes	Interesting Asides	Friction	Frictional force

12. MS_ Types of Friction

Types of Friction:



Static Friction:

This is the type of friction that one can feel when one object constantly tries to stay put over the other object. The friction between the feet and the ground on which the feet are placed each time when a person walks is one such example.



We take firm steps by frequently lifting and resting our feet on the ground. While walking, our feet try to come to rest on the ground on every single step.

This is required for us to be able to walk on the floor. This is also the reason why we tend to slip when we walk on wet floors, or icy ground, where the static friction is very less or almost nil.

Sliding Friction:

This is the kind of friction that you can feel when one object slides over the other. As the surface allows you to slide and still lets you stay in control, such friction is of a magnitude less than static friction.

Some common examples where you can feel this kind of friction is on the banister of a staircase, that lets you slide your hand across it as well as lets you get a grip of the banister for support while climbing up or down the stairs. The friction between that of a pencil and the paper is a sliding friction.

Also, the playground slide where children slide up and down has sliding friction.



Rolling Friction:



This is the kind of friction that acts on objects when one object rolls over the other. This is the friction between a vehicle and the road. Another example is a roller-skater.

Fluid Friction:

Fluid friction is that kind of friction that acts on objects that are moving with the help of a fluid which can be a liquid or gas.

A skydiver in a parachute, falling down towards earth faces the resistance of air against his descent; hence, he glides down slowly.



Another example would be kites flying high in the air. The force of the wind acting on kites must be able to overcome the force of gravity as well as frictional force/drag to fly high and forward.

Objects that are lightweight and tend to move fast face greater resistance from air, thus controlling their motion. The frictional force exerted by fluids is called **drag**.

Image source:

Roller Skater - https://www.srisathyaivaividyaVahini.org/alfresco/d/direct/workspace/SpacesStore/81860ddf-8114-4375-8b45-6b61f3a1cce0/roller-skates-6951?ticket=TICKET_26bcf5f1d39d08f1eb325b8a79a209b1f359d9c4

Walking on wet floor - https://www.srisathyaivaividyaVahini.org/alfresco/d/direct/workspace/SpacesStore/3b016d98-261d-4842-a578-55ad8055447d/walking-on-a-wet-floor-6666?ticket=TICKET_26bcf5f1d39d08f1eb325b8a79a209b1f359d9c4

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Parachute - <https://pixabay.com/vectors/parachuting-parachute-glide-falling-1781587/>

Kite flying - <https://pixabay.com/illustrations/fly-a-kite-child-playing-street-play-1242614/>

Slide - <https://pixabay.com/illustrations/fitness-center-fitness-studio-1825635/>

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Main Script	Friction	Kinds of friction

13. DD_ Importance of friction in our daily life

Friction force:

1. When a door does not swing freely, then we apply oil on the hinges to reduce the friction so that the door can swing open or close freely.



2. When a match-stick is struck against the sides of a match box, friction produces heat energy which helps in ignition. It should be understood here that friction helps in ignition; however, it must be noted that friction is not the only reason that causes ignition.



3. The trolley bags that carry luggage are fitted with rolling wheels with no grooves. These wheels lower the friction, thus enabling a person to move the heavy luggage fast.



4. The rope and the pulley on the blinds or curtains. They help in rolling the blinds upwards/downwards.



5. A rag that is rubbed against the kitchen counter to clean the surface helps remove dirt on the surface due to friction.

6. A sliding glass door or glass window moves back and forth because of the sliding friction.



7. Traditional grinders take advantage of friction to grind materials.



8. The door mat that is used to remove dirt from shoes uses friction to achieve the same.



9. We use talcum powder on surfaces of carrom board, and tabla to reduce friction and provide smoothness to the surface.



Image source:

<https://pixabay.com/illustrations/door-open-door-wooden-door-1202905/>

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<https://www.publicdomainpictures.net/en/view-image.php?image=241778&picture=window-blinds-purple>

https://commons.wikimedia.org/wiki/File:Upvc_Patio_doors.JPG

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Time to teach	Asset Type	Theme	Sub Theme
6 Minutes	Day-to-day Relevance	Friction	Kinds of friction, Frictional force

14. VC_ The Bridge

Friction is caused by the irregularities on the two surfaces in contact. The substances which reduce friction are called lubricants. When a lubricant is applied, interlocking of irregularities is avoided to a great extent. Thus, movement becomes smooth.

Many times, we encounter friction in daily life that arises due to disagreement and argument between our family members, friends and acquaintances.

How can we overcome this friction amongst us?

What are the lubricants?

The answer is the Human Values like Love & forgiveness. Love is latent in us and is like a common thread that binds the world's ethical and cultural traditions.

Quote:

Try not to become a man of success, but rather try to become a man of value.

Albert Einstein

Story – The Bridge

Suraj and Nikhil were brothers. They lived side by side with their families for many years. They always worked together in their farms, shared knowledge and equipment, and lent a helping hand to each other in times of need.



One day they had a silly argument, and it flared up. It became a serious disagreement that they ever had in the past 40 years. The fight became so serious followed by an angry exchange of words and months of silence.



There was a stream across their farms which made the whole area around them green. One day, Nikhil changed

the stream's path, making it as a border between their farms.



Next morning when Suraj opened his door he was shocked and agitated. Immediately he called a carpenter and asked him to construct a 10 feet tall fence, so that he would never see Nikhil's face again.



The carpenter observed the happenings going on there, thought for a while and agreed for the work. Suraj had to go out. When he came back in the evening, the carpenter had finished his work.

Suraj arrived near the stream, and was stunned. He was in for a big surprise and couldn't say a word. The place where he ordered to build a fence had a new bridge now!! It was very artistically built with carvings.



At the same time Nikhil happened to come to the same spot. He ran over the bridge and embraced his brother. His eyes were filled with tears and said to Suraj, "You are really very special. Even after I had said and done many things against you, you had built this beautiful bridge."



As both brothers were hugging, the carpenter slowly collected his tools and started walking away. The brothers requested him to stay for few more days. The carpenter said that he would love to stay, but he has some more bridges to be built and things to fix in other places!!



Dear children,

- Don't allow pride to come before our love.
- Learn to forgive and appreciate what you have. Uphold your values.
- Remove the friction in your lives. The past cannot be changed but the future can be.
- No dispute should spoil a true relationship. Build your bridges when you have to and cross them with a smile.

Image Source:

<https://freesvg.org/house-and-green-rolling-hills>

<https://www.youtube.com/watch?v=rr7FWajgxxM>

<https://www.youtube.com/watch?v=dAXgKifZiZM> (Attribution - [Eliza Siddiqui](#))

<https://pixabay.com/vectors/bridge-construction-wooden-145610/>

<https://www.youtube.com/watch?v=xFoU6JrG9dc> (Attribution - [Yasser Fayad](#))

<https://www.youtube.com/watch?v=778n3z9ZD4U> (Reuse Allowed)

Time to teach	Value Type	Value Sub Type	Value Attribute
5 Minutes	Love		Stories

15. QA_ Frictional Force

1. How many types of friction are there?

Answer: Four: static, rolling, sliding, and fluid friction.

2. How are the friction forces classified?

Answer: They are classified based on the type of relative motion between two objects.

3. What are the main factors that determine the strength of friction force?

Answer: The smoothness of the surface & weight of the object which moves on the other object.

4. What happens when we rub both our palms together?

Answer: The hands become warm caused by the friction that develops when palms are rubbed against each other.



5. Is there a friction while hammering a nail on the wall?



Answer: Yes, when the nail is being hammered into the wall, there is friction. Depending on the thickness of the wall, the frictional force would vary, hence, making it easier or harder to hammer the nail onto the wall.

6. What kind of friction is seen in tyres?



Answer: Tyres that roll on the road experience rolling friction.

7. What is the major factor that affects fluid friction?

Answer: While there are other factors that affect fluid friction, the shape of the object is the major factor that affects fluid friction.

8. Can you cite few examples for sliding friction?

Answer: Car sliding on ice, car tyres on road when brake is applied, a violin bow.

**9. Is there a static friction on the car tyre when brakes are applied?**

Answer: Yes. While the sliding friction between a car tyre and the brake pads are responsible for the brake in the continuous movement of a car tyre, the static friction between the car and the road's surface is responsible for maintaining the brake position.



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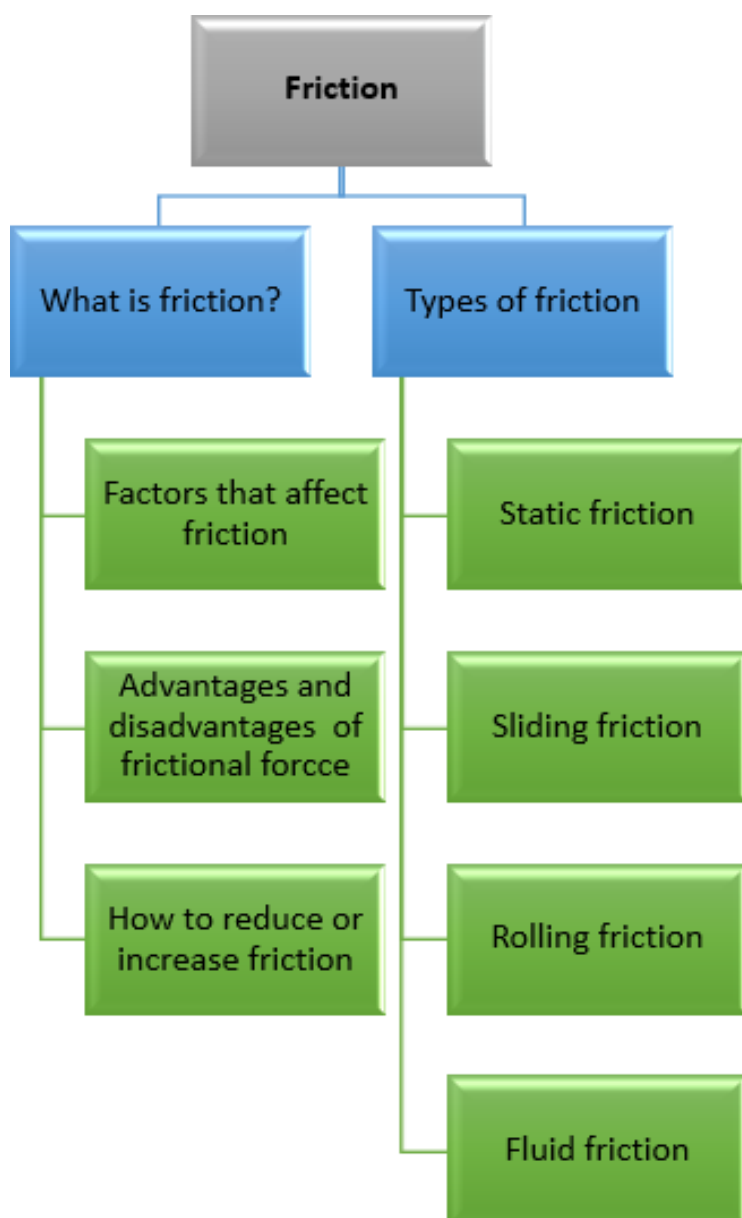
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Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Assessments	Friction	Frictional force

16. MS_ Summary_ Friction



Time to teach	Asset Type	Theme	Sub Theme
15 Minutes	Main Script	Friction	Kinds of friction, Increasing friction, Friction in fluids, Factors affecting friction, Causes of friction, Friction in force, Factors affecting friction, Disadvantages of friction, Advantages of friction

Master Lesson Plan

Seven Asset Methodology for MLP	
What is the purpose of this Master lesson Plan?	This Master Lesson Plan (MLP) prepared by Sri Sathya Sai Vidya Vahini, covers the entire chapter for the given board. The chapter given in the textbook is broken down into smaller modules known as assets. One of seven teaching methods is applied to each asset. Several different assets together complete the entire chapter. Each asset is supported by a teaching aid such as animated presentation, audio, video, worksheet; that the teacher can use in the class, while teaching that module. The MLP is for the teacher's preparation and the teaching aids are for use in the classroom.
How to use it?	You can prepare for your class with this MLP by following 3 simple steps:1. Read your textbook; 2. Go through the information given in the assets (document & multimedia); 3. Prepare your teaching notes. Great! Now you are ready to transact the chapter.
Duration	Kindly note the duration given for each asset. Due care has been taken in planning the assets, to ensure the chapter is completed within the time specified by the Board. Note: Preparation time is not included in the asset duration. The teaching time depends on the duration of the teaching aids and is not impacted by the length of the MLP.
What is a 'Main Script' (MS) Asset?	The Main Script asset is there for explaining the main concepts of the chapter clearly. The information given in the textbook is simplified, organised and structured to give more clarity. Additionally, you may find a video or mnemonics or a graphic organiser to deepen the understanding of the concept.
How to teach using the MS asset?	Please use the blackboard, slides and interaction to develop the concept.
What is an 'Inquisitive Questions' (IQ) asset?	The Inquisitive Questions asset uses questions to promote higher order thinking like the n^{th} why, what-if, new perspectives, cause-effect, and others, creating curiosity.
How to teach using the IQ asset?	You may use the questions to connect with the students, encourage exploration to engage them in the learning process. You may allow multiple responses and instead of rejecting any of the responses, ask why, before revealing the suggested answer or hints.
What is a 'Day to day Relevance' (DD) Asset?	The Day to Day Relevance asset helps students understand the practical relevance of every topic, making them eager participants in the classroom. If students connect the concepts to their environment, they would learn meaningfully without dislike or simply memorizing for exams.

How to teach using the DD asset?	You may use the asset by asking questions about their experience and use it to establish why they are learning the topic. If necessary you may substitute with a recent or local example.
What is an 'Interesting Aside' (IA) asset?	The Interesting Aside asset uses attention grabbing titbits or anecdotes to bring joy and satisfy the child's hunger to know more. This is a quick/short asset intended to bring attention back to the main concept being taught.
How to teach using the IA asset?	You may use this asset to give a piece of interesting information relevant to the topic, without prolonged explanation/discussion. You may suggest appropriate books for further reading.
What is a 'Suggested Activity' (SA) Asset?	The Suggested Activity asset provides a detailed step by step procedure for the teacher to conduct a hands-on activity. This promotes Activity Based Learning.
How to teach using the SA asset?	You may use this asset to energise your students to learn by doing simple, fun-filled activities based on the topic. The asset includes - preparation, activity, and follow-up. You may engage the students in the preparation and follow-up stages to develop collaboration and responsibility. You could try it once, yourself, before the actual delivery to be more comfortable with it. Note: The duration mentioned in the asset is usually for the activity part only.
What is a 'Value Content' (VC) Asset?	The Value Content asset integrates Universal Human Values (such as empathy, inclusivity, respect for nature that translates into responsible behaviour) seamlessly into the curriculum, as the "End of education is character".
How to teach using the VC asset?	You may use this asset to engage with the students to bring out their innate values and connect with the intrinsic values in the topic/concept. The asset includes pointers on the specific pedagogical technique followed.
What is a 'Questions to Assess' (QA) asset?	The Questions to Assess asset uses an interactive approach to check learning of different types of learners, and provides feedback to the teacher for appropriate action. The questions cater to all the levels of Bloom's Taxonomy. Questions from 'Apply' level and above enable students to reflect on their learning.
How to teach using the QA asset?	You may go through the slides to understand its flow and know when to click for the answer (slides include suggested answers). While presenting in the class, you may display the question and encourage multiple responses, before revealing the answer. In some cases, this asset may include extra questions/worksheet that can be given as homework.