



Master Lesson Plan

For

Force and Pressure

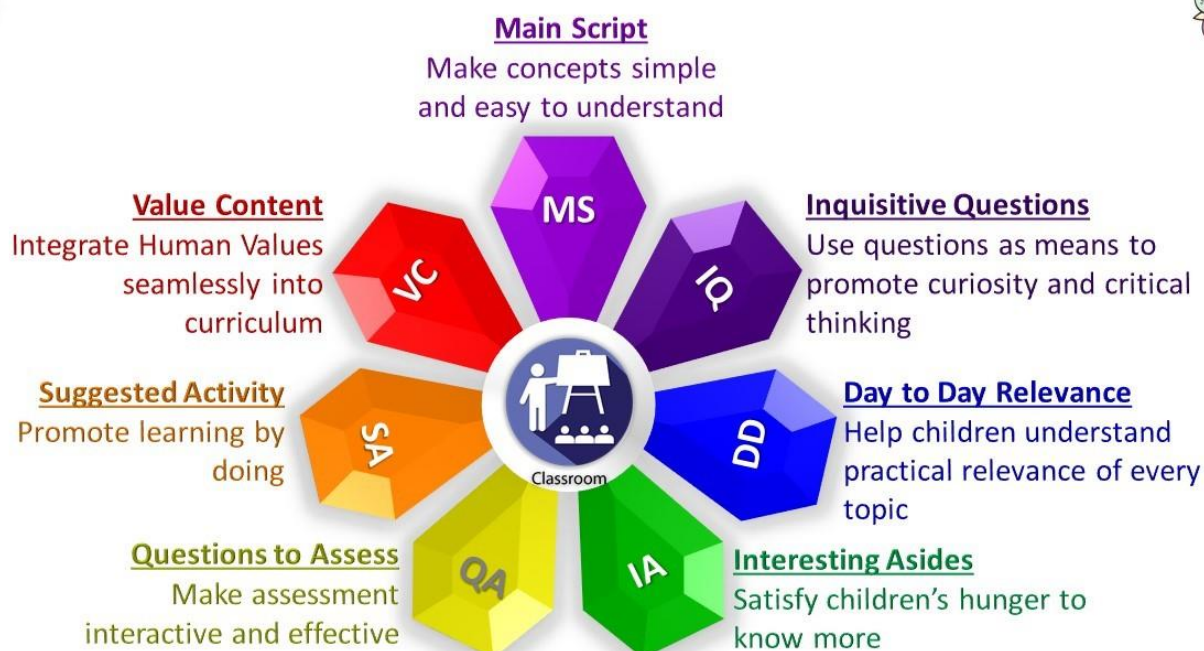
Board	Standard	Subject	Chapter	Language	Reference Link	Creation
CBSE	STD VIII	Science	Force and Pressure	English	Force and Pressure	2020-12

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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.

Force and Pressure

1. MS_ Objectives_ Force and pressure

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...

- recognise push and pull
- deduce the questions on force
- show how force can have various impacts on an object
- examine the forces between objects
- discover the impact of force and pressure through an active chat session
- benefit from the additional information on driving in snow
- identify the reasons behind certain actions
- relish the information on horse power.
- judge the dangers caused by static electricity
- recognise a small value through the concept where charged objects attract uncharged ones
- use a spring balance to weigh objects
- show that liquids exert pressure sideways
- relish the interesting facts on devices that help measure different types of pressure
- explain how the coconut grater sits comfortably on the table top to enable the process of grating
- correlate the applications of pressure in our daily life
- revise the topic 'Force and pressure'

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

2. SA_ What is Force

Aim: To understand what is force through a small activity.

Setting: Pair of students in a group.

Materials Required: Paper, Pen.

Precautions: None in specific.

Steps:

To classify the following tasks as push or pull.

NO.	TASK	PUSH	PULL
1	Moving a book placed on a table		
2	Opening a door		
3	Drawing water from a well		
4	A football player taking a penalty kick		
5	A cricket ball hit by a batsman		
6	Moving a loaded cart		
7	Opening a drawer		
8	Hoisting a flag		
9	Moving a standing bike		
10	Opening the cap of the pen		

Observation:

Each of the actions can be classified as push or pull. A push or pull on an object is called force. The object is subjected to movement upon applying a force which can be either a push or pull.

Discussion Points:**1. What is force?**

Answer: A push or pull on an object is called force.

2. What impact does a push or pull have on the object?

Answer: The object is displaced from its original position.

3. How many objects are involved in push and pull action?

Answer: Two objects are involved in push and pull action.

Conclusion:

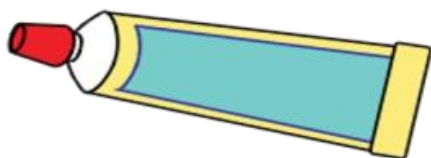
Thus, force can be classified as a push or pull on any given object.

Time to teach	Asset Type	Theme	Sub Theme
15 Minutes	Suggested Activity	Force	Pulling and pushing forces

3. IQ_ Force

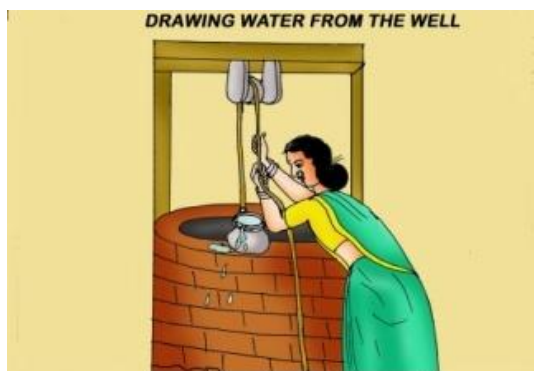
[Notes to the teacher - Teacher may enable the students to think and come out with as many answers as possible before giving out the right answer/ answers]

1. What happens to the toothpaste tube when squeezed?



Suggested Answer: The paste is pushed out when force is applied on the tube. When we squeeze the toothpaste tube, its shape changes.

2. What is the type of force needed to pull a bucket of water from a well?



Suggested Answer: The force on the bucket is upward (pulled/lifting)

3. What type of force is required for a person to open a drawer?

Suggested Answer: The pulling force is applied on the drawer.

4. In which direction do you think that the two teams apply force in a game of tug-of-war?



Suggested Answer: The team applying greater force wins

5. Any moving body has a force, is it correct?

Suggested Answer: Yes, it has a force of impact on it.

6. What is the woman doing to drain the water out of the clothes?

Suggested Answer: The woman is squeezing the clothes to remove the excess water. For this she has to use the force in her hands.

7. What does Salman have to do when riding the bicycle? Does it take effort? Once the cycle is moving, how does he stop it?



Suggested Answer: Salman has to use his muscle power by applying force on the pedals with his legs. This requires effort although he doesn't seem to show it. To stop the cycle, he has to press the brakes with his hands.

8. Can a brick be broken with a simple touch or do we have to hit the brick hard for it to break?

Suggested Answer: The brick has to be hit hard i.e. with a lot of force to break it.

9. What is the tractor doing on the field? Can one person do the same job with the same speed?



Suggested Answer: The tractor is ploughing the field. Since it is a machine, it can exert more force and do this job faster than a man.

10. Why is the man who is jumping off the cliff going down and not up?

Suggested Answer: The man jumping from the cliff is being pulled by gravity towards the earth. So, he is not going upwards.

11. Why do you think the man is falling on the floor?

Suggested Answer: The floor is wet and so the friction between the man's shoes and the floor is less causing him to slip on the floor.

12. What happens to chapati dough when we apply force?

Suggested Answer: It changes its shape.

13. Can you give an example where there is no change in the state of motion due to force?

Suggested Answer: If we push a heavy rock it does not move.

14. Think of an example where force can change the direction of an object.

Suggested Answer: A batsman hitting a ball.

15. Think of an example where force can make moving objects stationary.

Suggested Answer:

- A goalkeeper strives to stop the ball.
- A fielder catches a ball

Note to the teacher: *The above questions are meant to facilitate discussion and get the students to understand the concept of force. Accordingly, any questions the teacher thinks appropriate can also be added. Some answers are provided below as guidance. The students may not be able to answer all the questions at this time, so the teacher can come back to them later after the concepts have been explained.*

Image Source:

Tractor: <https://pxhere.com/en/photo/567802>

All other Images: SSSVV Gallery

Time to teach	Asset Type	Theme	Sub Theme
10 Minutes	Inquisitive Questions	Force	Pulling and pushing forces

4. SA_ Impact of force on an object

Aim: To show that force can change the shape of an object.

Setting: Pair of students in a group.

Materials Required: Paper, Pen

Precautions: None in specific.

Steps:

Students to make observations on a given task and write their answers as 'Yes/No' under the column about force making an impact in the shape of the given object.

Observation Table:

S.No.	Situation	How to Apply Force	Action of force	
			Change in state of motion	Change in Shape
1.	A lump of dough on a plate.	Pressing It down with your hands		
2.	Spring fixed to the seat of a bicycle.	By sitting on the seat		
3.	A rubber band suspended from a hook/nail fixed on a wall.	By hanging a weight or by pulling its free end		
4.	A plastic or metal scale placed between two bricks	By putting a weight at the centre of the scale.		
5.	A pillow available for seating	By sitting on a pillow		
6.	Ball hit by a bat	By hitting the moving ball in cricket		
7.	Moving ball caught by a person	When the ball is caught by a fielder in the game of cricket		

Discussion Points:

From the above exercise , we can understand that force can

- Change the shape of an object: Example: Pillow, chapati dough from the above exercise.
- Change the direction of motion of an object: Example: Ball hit by bat in the above exercise.
- Change the speed of a moving object. Example: Moving ball caught by a fielder reduces the speed of the bat in the above exercise.
- Change the state of rest of an object: Example: Rubber band exercise.

Conclusion:

Thus, we can conclude that force can possibly alter the shape or state of an object. It can also be understood that it can alter the speed of a moving object or its direction.

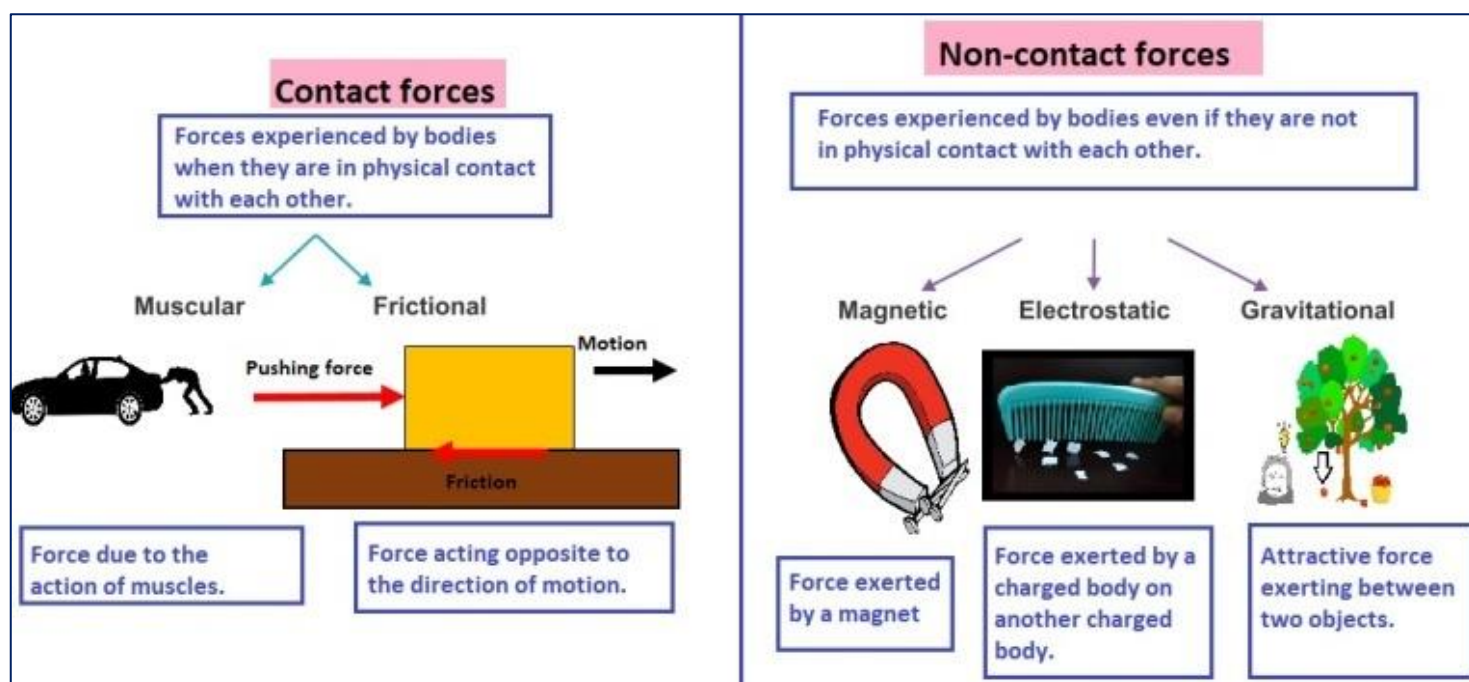
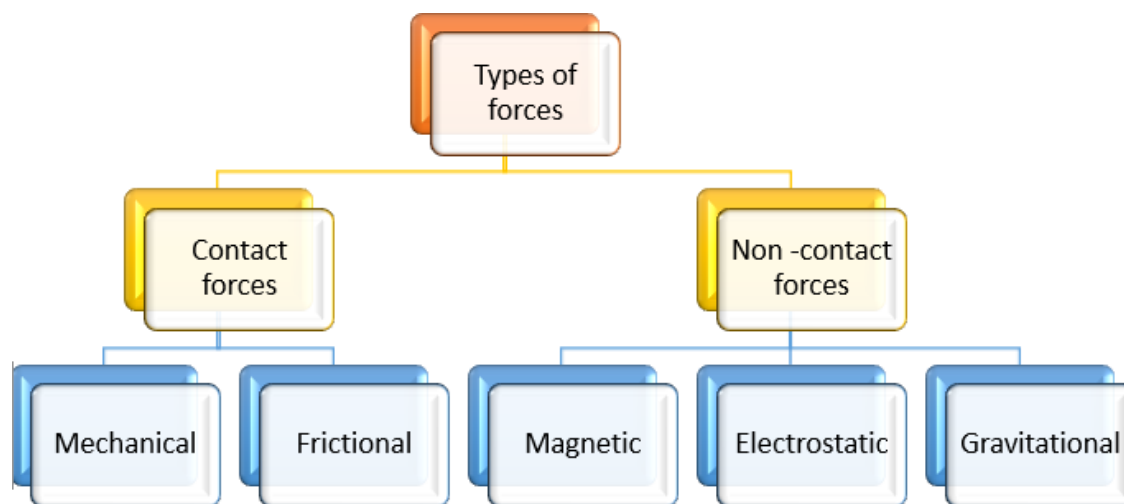
Time to teach	Asset Type	Theme	Sub Theme
15 Minutes	Suggested Activity	Force	Forces due to interaction

5. MS_ Forces between objects

A force is a push or pull on an object that arises due to interaction between two objects.

Types of forces

A force can act on an object with or without being in contact with it.



Contact force:

It is the force in which the two interacting objects are physically in contact with each other.

Example: muscular force



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

Friction 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 has to be increased or decreased. For example, the ramps or slopes in railway stations are made rough so that people don't slip while walking. On the other hand, the surface of slides found in parks is smooth so it's more fun for children to play on it. Again, the ramp in a bowling arena is smooth so that the ball can roll easily.



Non Contact Forces / Action -at- a distance forces

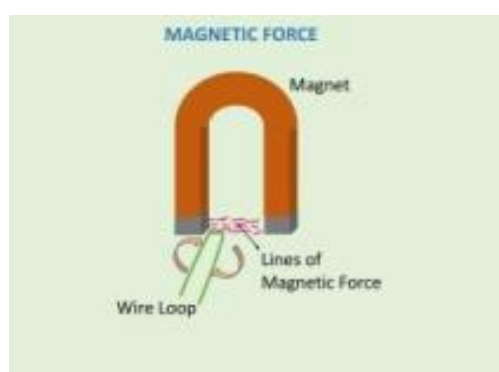
It is the force in which the two interacting objects are not in physical contact with each other.

Examples

- Magnetic force
- Electrostatic force
- Gravitational force

Magnetic Force

The force exerted by a magnet on another magnet or on objects made of iron, cobalt or nickel is called as magnetic force.



Unlike poles of two magnets attract each other



Attraction can be considered as pull operation.

Like poles of two magnets repel each other.



Repulsion can be considered as push operation.

For attraction or repulsion, two magnets need not be in contact with each other. So, magnetic force is a non contact force.

Electrostatic force:

- It is the force exerted by a charged body on another charged or uncharged body.
- If certain electrical insulator materials such as plastic are rubbed, an electrostatic charge develops on them
- Objects with like charges repel (push) each other. Objects with unlike charges attract (pull) each other.

A plastic straw rubbed with paper attracts another straw but repels the second straw if it has also been rubbed with a sheet of paper.

A plastic comb rubbed through our hair attracts the pieces of paper.



Electrostatic force exists even when the interacting objects are not in contact with each other. So, electrostatic force is a non-contact force.

Gravitational force:

It is the attractive force exerted by every object in the universe on every other object. Gravitational force depends on the mass of the objects and the distance between them. Gravitational force is always directed downwards.

Frictional force:

$$F = G \frac{m_1 m_2}{r^2}$$

Where G is the gravitational constant ($6.67 \times 10^{-11} \text{ m}^3 \text{ s}^{-2} \text{ kg}^{-1}$), r is the distance between the two objects, and F is the magnitude of the force between the objects and m_1 and m_2 are the masses

River water flows downwards due to gravitational force.



This gravitational force makes an apple to fall downward to the ground when it is detached from the tree.



Gravitational force is responsible for keeping all the planets in their respective orbit around the sun.

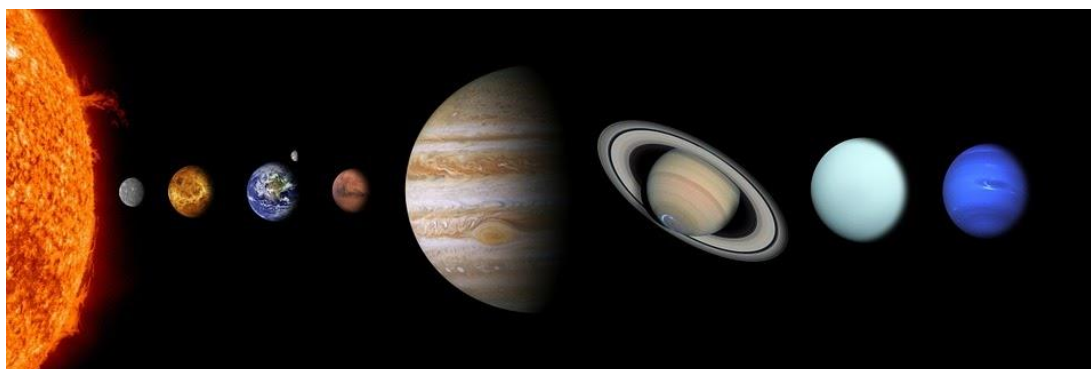


Image Source:

<https://pixabay.com/en/gym-bench-weight-lifter-gymnasium-32740/>

<https://pixabay.com/en/bullock-cart-ox-waggon-waggon-331254/>

Slip: SSSVV Gallery

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

Magnets: OC: Original contribution:pavani.sathyasai@gmail.com

River: SSSVV Gallery

Apple tree: SSSVV Gallery

<https://pixabay.com/vectors/pushing-man-car-silhouette-engine-3839062/>

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<https://pixabay.com/illustrations/apple-tree-apple-red-branch-3738091/>

Magnet: SSSVV Gallery

Solar system: <https://pixabay.com/en/solar-system-sun-mercury-venus-439046/>

Time to teach	Asset Type	Theme	Sub Theme
10 Minutes	Main Script	Force	Non-contact forces, Contact force

6. IQ_ Impact of 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]

Question 1: When we roll a toy car over a rug, it quickly comes to a standstill. How?

Answer: It's because of friction. The frictional force absorbs the car's energy and slows it down.

Question 2: A car goes round a corner, the frictional force holds the tyres of the car in place, giving a powerful grip that locks the car to the road and stops it skidding outward. How?

Answer: This is because as the tyres grip the road, the wheels push forward, moving the car along. At exactly the same time, friction between the wheels and the axles that hold them takes some of their energy, slowing them down.

Question 3: Why does a comb attract small pieces of paper after rubbing it against the hair?



Answer: The electrostatic force that is created attracts the pieces of paper. The force of attraction is directly dependent on the electric charges acquired through the process of rubbing the comb against the hair.

Question 4. What is the working principle of these trains ?



Answer: Magnetic levitation. Magnetic levitation uses two sets of magnets, one set to repel and push the train up / above the track, and another set to move the elevated train ahead, taking advantage of the lack of friction.

Question 5. Do we make use of gravitational force ever in daily life?

Answer: There are many applications of gravitational force. Some of them are cited here as examples: The water supply to the entire house is done by making use of gravitational force where the water flows from an overhead tank down to the entire house.



Cranes -when they lift huge objects, they use gravitational force to drop those heavy objects on the floor.



Image Source:

Train: SSSVV Gallery

Comb: SSSVV Gallery

Tap: <https://pixabay.com/photos/faucet-fountain-water-dispenser-1684902/>Crane: <https://pixabay.com/vectors/crane-machine-heavy-equipment-158339/>

Time to teach	Asset Type	Theme	Sub Theme
10 Minutes	Inquisitive Questions	Force	Pulling and pushing forces, Forces in the same direction and in opposite direction, Force interaction, Contact forces, unbalanced forces,

7. IA_ Safe driving on snow

In some countries, it snows a lot during winter. This makes it dangerous to drive because snow and ice (which is formed when the snow partially melts) reduce friction between the tyres and the road. To increase friction and prevent skidding, metal chains are wrapped around the tyres.

Image Source: SSSVV Gallery

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

8. IQ_Impact of Frictional 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. Have you played a game of carrom? If so, do you find it easier to strike the coins when the board has been sprinkled with talcum powder? Why is that?



Answer: Talcum powder reduces friction between the striker and the board, making it easier to move.

2. If your palm is wet and you try to hold a pencil and write, do you find it hard to do so? Why?

Answer: When the palm is wet, the friction between the fingers and pencil is reduced, causing the pencil to slip. Therefore it becomes difficult to write.

3. If a ring is tightly worn on your finger what do you do to get it out?



Answer: A tight ring can be pulled out of the finger by applying soap water. This reduces friction between the ring and the finger making it easier to come out.

4. Why do tyres of motor vehicles have grooves?



Answers: Tyres of vehicles have grooves to increase friction between the road and the tyre and prevent skidding.

Image Source:

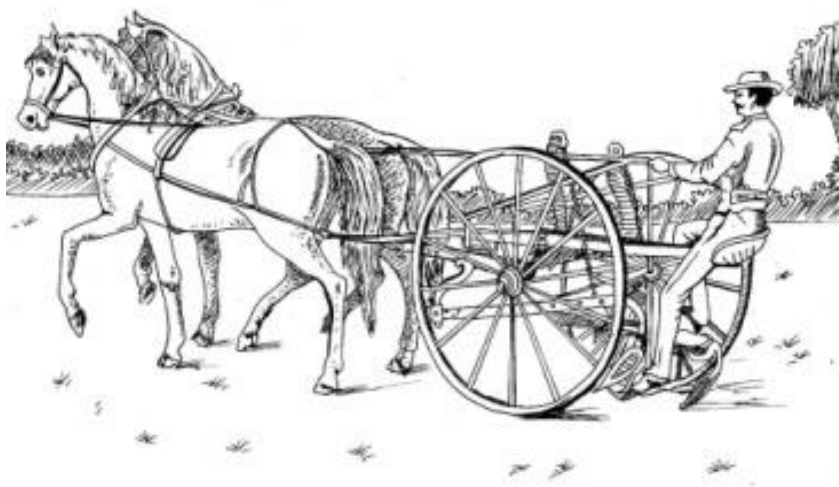
Carrom: SSSVV Gallery

Tyres: SSSVV Gallery

Washing hands: SSSVV Gallery

Time to teach	Asset Type	Theme	Sub Theme
2 Minutes	Inquisitive Questions	Friction	Kinds of friction, Increasing friction, Frictional force, Factors affecting friction

9. IA_ Power of horse vs horse power



In the olden days, before the invention of engines and vehicles, horses were used to carry people and goods from one place to another. As a result, the term horse power (hp) has now become the unit for measurement of power. For example we say that the engine of a car generates 381 horse power or 728 horse power. The term was adopted in the late 18th century by Scottish engineer James Watt to compare the output of steam engines with the power of draft horses.

Image Source: SSSVV Gallery

Time to teach	Asset Type	Theme	Sub Theme
3 Minutes	Interesting Asides	Force	Unit of Force

10. DD_ Static Electricity



1. It is important to avoid sources of static electricity in petrol pumps because even a small amount of electricity can cause a spark and lead to a fire. That's why cellular phones should not be used in petrol pumps.
2. A photocopier uses a static electricity image to attract ink.



3. **Electrostatic Spray painting:** Static electricity is used to paint cars, tools, boats, etc. The object to be painted is given a static charge so that it will attract the paint that is being sprayed.



4. **Fabric Softener Sheets:** When clothes dry in a dryer, they rub together, creating static charges. Fabric softener sheets that are used while washing clothes, act as conductors, allowing electrons to move around the clothes more easily.



5. Lightning that we see in the sky during rainy days is a powerful and dangerous example of static electricity. Some electronic chips, like the kind that are in computers, are very sensitive to static electricity. Hence we should turn off the electronic devices during lightning.



Image Source:

Petrol pump: SSSVV Gallery

Photocopier: <https://pixabay.com/vectors/photocopier-printer-multifunction-297547/>

Car painting: <https://pixabay.com/photos/car-painting-garage-paintwork-498439/>

Washing machine: SSSVV Gallery

Lightning: SSSVV Gallery

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Day-to-day Relevance	Force	Contact forces

11. VC_ Self regulation of feelings

Learning domain : Classroom

A central idea for students to understand is that electrostatic forces are non-contact forces; it is not important at this level to emphasise to students that 'like charges repel and unlike charges attract'. It is more appropriate to demonstrate that charged objects attract uncharged objects and can either attract or repel other charged objects.

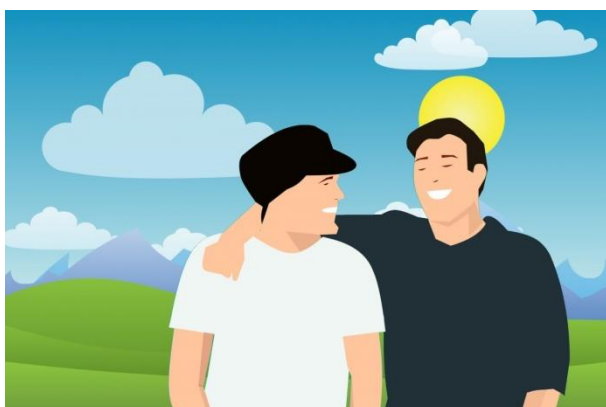
Quote:

Be the reason someone smiles today. Spread positivity.

Emotional contagion is the phenomenon of having one person's emotions and related behaviours directly trigger similar emotions and behaviours in other people.



Positive emotions and generally positive people can have a tremendous effect on people. Researchers have found that when people "catch" positive emotions from others, they're more likely to be viewed by others as more cooperative and competent.

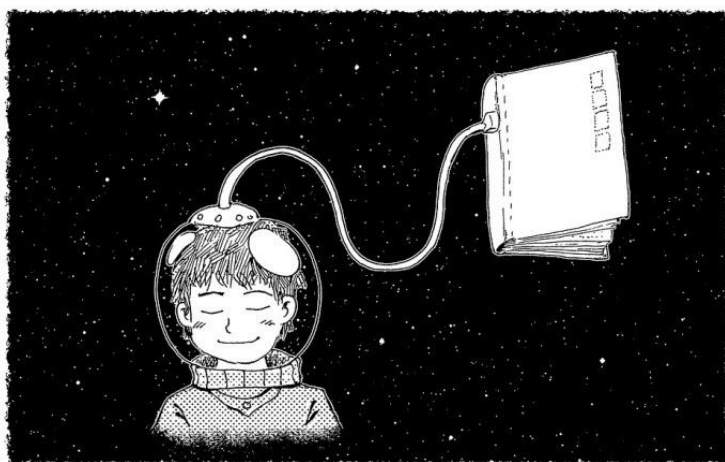


Stephen William Hawking (1942 - 2018) was the former Lucasian Professor of Mathematics at the University of Cambridge and author of A Brief History of Time which is an international bestseller.



In 1963, Hawking contracted motor neurone disease and heard a doctor tell him that he had only two more years to live.

'Right then,' he thought to himself. 'Now that I don't need to worry about things like pensions or paying the bills, I can concentrate on trying to understand the universe.'



Two years went by, twenty years went by, and Hawking lived till 2018.

He could communicate his highly abstract ideas through a tiny computer hooked up to his wheelchair and which has a vocabulary of only 500 words. He wrote his classic "A Brief History of Time" and was responsible for creating an entirely new vision of modern physics. Always smiling, in the book, he talks jokingly about how the prospect of early death urged him to discover a new way of thinking.



Children!

Like Stephen Hawking, besides smiling, remind yourselves everyday that you are here on earth for a reason. You have talents and qualities that can bring goodness to others. A kind smile, a good word, a loving gesture – simple things that can change people.



Image Source:

<https://pixabay.com/vectors/people-team-office-company-work-4386248/>

<https://pxhere.com/en/photo/1450847>

<https://www.youtube.com/watch?v=IR3z4JoeDb8> (Attribution - Unboxing Studies)

<https://pixabay.com/illustrations/fairy-tale-fantasy-dream-night-1077863/>

<https://pixabay.com/illustrations/creative-spirit-hawk-joy-spiritual-401405/>

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

12. DD_ Spring balance



A spring balance is used to weigh an object which is hung from the hook on the lower end. Gravity pulls the object down. At the same time, the tension in the spring pulls the object upwards which causes it to swing. When the tension in the spring and the gravitational force become equal, the object stops moving. The gravitational force acting on it in this position can be read from the scale. This gravitational force is the weight of the object. The first spring balance was invented in Europe in 1771.

- A spring balance is a weighing apparatus used in industries to measure the mass of different loads.
- It is also used in science experiments as a basic accelerometer.
- Spring balances are used to weigh heavy loads such as trucks, storage silos, and material carried on conveyor belts.

Note to the teacher:

Please play the video. The duration of the video is 49 seconds

Video source: <https://www.youtube.com/watch?v=Dfrl-EcU0kQ> (Attribution - [David Lippman](#))

Image Source: Spring balance - SSSVV Gallery

Time to teach	Asset Type	Theme	Sub Theme
3 Minutes	Day-to-day Relevance	Force	Pulling and pushing forces

13. SA_ Liquids exerts pressure side ways

Aim: To show liquids exert pressure sideways.

Setting: Pair of students in a group.

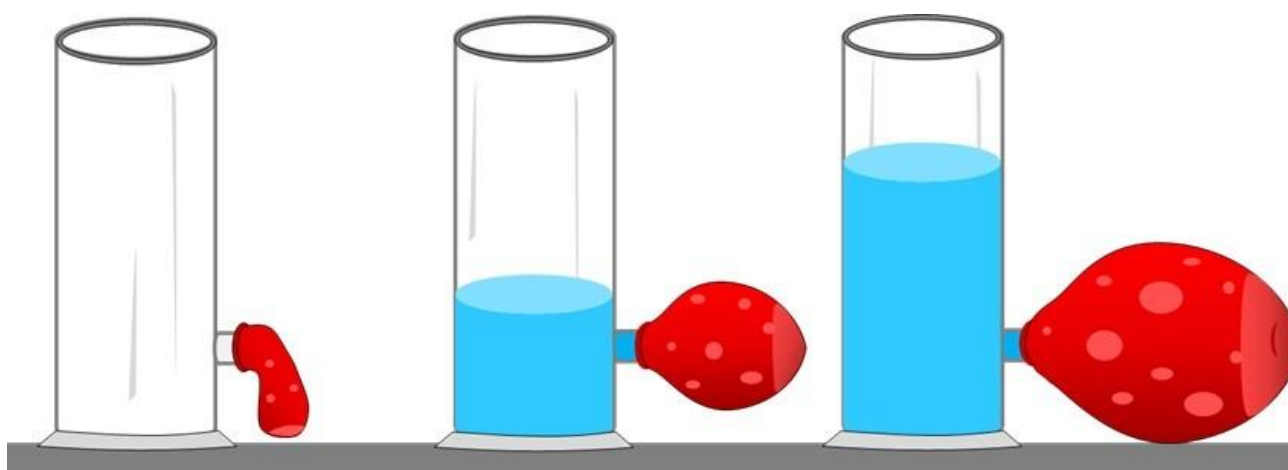
Materials Required: water bottle, balloon, water, small glass tube, molten wax.

Procedure:

- 1) Discard any water in the water bottle and pierce a hole at the side to insert the small glass tube.
- 2) Fit the small glass tube so that no water can leak through any gap. Use molten wax to seal the gaps to prevent any leaks.
- 3) Now cover the end of the glass tube with a balloon.
- 4) Fill half of the water bottle with water.

Observation:

The water exerts pressure on the sides and the result is that the balloon bulges this time.



Discussion Points:

1) Does water exert pressure at the bottom of the container?

Answer: Yes.

2) Does water exert pressure at the sides of the container?

Answer: Yes. That is why the balloon bulges.

3) What is the benefit of this water pressure exerted on all sides of the container?

Answer: This helps retain the water inside the water bottle.

Conclusion:

Thus we can conclude that water or any fluid would exert pressure in all directions.

Image source: rushmish@gmail.com

Time to teach	Asset Type	Theme	Sub Theme
20 Minutes	Suggested Activity	Pressure & Density	Pressure exerted by liquids Atmospheric pressure

14. IA_ Devices to measure different types of pressure

Did you know?

1) Sphygmomanometer is the name of the device used to measure blood pressure. Pressure is measured in units of millimeters of mercury.



2) Barometer is the name of the device used to measure air pressure. This can measure pressure in millibar range.



3) Bourdon Gauge is the device that can measure both gas and liquid pressure. This can measure pressure up to 7000 bar.



4) Mamometer is the device commonly used for checking pressure difference in a pipeline:



5) A device that uses an electrical circuit to convert motion that is caused by mechanical pressure into electrical signal is called Electric Pressure Transducer.

Image Source:

<https://pixabay.com/photos/sphygmomanometer-blood-pressure-915652/>

<https://pixabay.com/photos/barometer-thermometer-russian-2715600/>

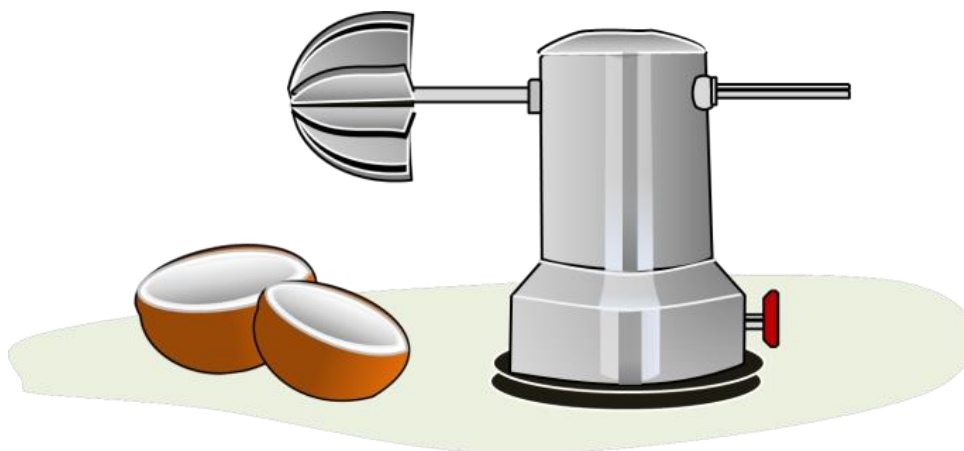
<https://pixabay.com/photos/old-antique-technology-3155763/>

<https://pixabay.com/vectors/manometer-measure-pressure-40253/>

Time to teach	Asset Type	Theme	Sub Theme
3 Minutes	Interesting Asides	Pressure & Density	Meaning & Definition of pressure

15. MS_ Coconut Scraper

We all use vacuum fit coconut scrapers at home. How does that work?



When the lever given is used to fit the scraper on a surface, say wooden surface, all the air between the rubber and the surface escapes out thus creating a vacuum.

The atmospheric pressure acting on the rubber from outside helps retain the device firmly on the surface. Since it is fit firmly on the wooden surface, the user can now freely rotate the top lever to scrape coconut.

Image Source: Original contribution - rushmish@gmail.com

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Main Script	Pressure & Density	Thrust and pressure, Atmospheric Pressure

16. DD_ Applications of Pressure in Daily Life

- 1) Cutting appliances like scissors, knives, etc apply pressure while cutting objects into halves. The edges of these appliances are very small thus increasing the pressure high enough to enable cutting.



2) When we suck water or juice through a straw, we reduce the air pressure inside the straw which creates an imbalance between the pressure inside the straw and outside it. The difference in air pressure forces the juice or water to move up the straw.



3) Similar to the working principle of a straw is that of a vacuum cleaner. This creates a low pressure inside the device and the device sucks the dust and dirt inside it which can be discarded later.



4) Pressure cooker that cooks rice works based on pressure. The rice is actually cooked to edible consistency after the stove is turned off and the pressure that was built inside the cooker up until then is slowly reduced after removal of heat.



- 5) To open a tightly sealed container that has food or any item under high temperature and pressure, one can run the container under the tap water, to reduce the pressure to open it.



- 6) Washing machine dryer applies pressure to squeeze water out of the clothes. So do we, when we hand dry any wet towel.



- 7) We apply pressure while nailing a nail on to the walls. The pressure creates a hole inside in which the nail is safely secured.



8) Car wash with pressure hose. When we close the end of the hose with our fingers there remains a gap enough for water to escape, the water rushes out with great pressure which can be used for washing.



9) When pressure increases in the cycle tyre, the tyre would burst. When pressure inside the cycle tyre decreases, then pedalling the cycle is too difficult. Maintaining the correct pressure inside the tyre helps in smooth pedalling of a bicycle.



10) Churning butter out of milk happens when right pressure is applied while churning the milk.



Image Source:

<https://pixabay.com/photos/bell-pepper-capsicum-red-569070/>

<https://pixabay.com/photos/drinks-alcohol-cocktails-alcoholic-2578446/>

<https://pixabay.com/photos/vacuum-cleaner-suck-carpet-clean-1605068/>

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<https://pixabay.com/photos/mason-jars-dehydrated-fruit-oranges-2742757/>

<https://pixabay.com/photos/washing-machine-laundry-tumble-drier-2668472/>

<https://pixabay.com/photos/hammer-nails-wood-board-tool-work-1629587/>

<https://pixabay.com/photos/car-wash-motion-brushes-clean-1619823/>

<https://pixabay.com/photos/wheel-cyclist-sports-shoes-bike-4367292/>

Original contribution – rushmish@gmail.com

Time to teach	Asset Type	Theme	Sub Theme
10 Minutes	Day-to-day Relevance	Pressure & Density	Meaning & Definition of pressure

17. QA_ Force - A recap

I. Multiple choice questions:

1. The S.I. unit of force is -----.

- a. Erg
- b. Joule
- c. Newton
- d. Dyne

Answer: c. Newton

2. Kg.m/s^2 is the unit of -----.

- a. Momentum
- b. Speed
- c. Acceleration
- d. Force

Answer: d. Force

3. Which surface would require the least force to make a block move?

- a. Oiled surface
- b. Untreated wooden surface
- c. Surface covered with smooth sand paper

Answer: Oiled surface

4. A boy is cycling along a road. When he applies the brakes, which one of the following forces occurs between the brake pads and the wheels?

- a. Friction**
- b. Gravity**
- c. Stretching**
- d. Muscular**

Answer: a. Friction

5. Which one of the following is a disadvantage of friction?

- a. It stops a car from sliding off the road.**
- b. It helps a person to write clearly.**
- c. It keeps a runner from slipping.**
- d. It wears away the surfaces in contact.**

Answer: d. It wears away the surfaces in contact.

6. We experience many different types of force every day. Some of these are shown in the list below. However, one of these is NOT a force. Which one is it?

- a. Push**
- b. Pull**
- c. Speed**
- d. Gravity**

Answer: c. Speed

7. Magnetic force is

- a. contact force**
- b. non-contact force**
- c. both a and b**
- d. none of these**

Answer: b. non-contact

8. Force acting on an object may change its_____.

- a. Direction**
- b. shape**
- c. speed**
- d. all of the above**

Answer: d. all of the above

9. Which one of the following statements is not correct?

- a. Force can change the speed of an object**
- b. Force can change the shape of an object**
- c. Force can change the direction of motion of an object**
- d. Force can change the mass of an object**

Answer: d. Force can change the mass of an object

II. Answer the following questions:

1. Name one contact and one non-contact force?

Answer: Contact force : Muscular, Non- contact : Gravitational force

2. Which force acts from a distance and pulls an iron object?

Answer: Magnetic force

3. A plastic comb when rubbed with hair can attract pieces of paper. Name the force and its nature.

Answer: Electrostatic force

4. Pressure of liquid is----- in all directions at same depth (same/vary)

Answer: same

5. Pressure doesn't depend upon the size, shape of the container (T/F)

Answer: True

6. Name the force acting in each of the following case.

(a) Squeezing a piece of lemon between the fingers to extract its juice.

Answer: pressing

(b) Taking out paste from a toothpaste tube.

Answer: pressing

(c) A load suspended from a spring while its other end is on a hook fixed to a wall.

Answer: pulling

(d) An athlete performing a high jump to clear the bar at a certain height.

Answer: kicking

7. What is force?

Answer: The physical quantity that changes or tends to change the state of rest or motion or the shape of an object is known as force.

8. What is frictional force?

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

9. In a tug of war game, if the two teams exert equal force, neither of the teams win. Why?

Answer: Because of a balanced force.

10. Does force have a direction?

Answer: Yes, it has a direction. That is another reason why it can be classified as push or pull.

11. Does force affect shape?

Answer: Yes force can possibly affect the shape of an object depending on the magnitude of the force applied.

12. Does force change the state of motion of an object?

Answer: Yes it can push the object into motion or can impede the movement of a moving object or it can change direction of motion.

13. Should two objects necessarily stay in contact to experience the force imparted on each other?

Answer: No. There are magnetic forces, electrostatic forces which act on the object without any contact with it.

14. What is pressure?

Answer: Pressure is defined as force acting on a unit area.

15. What are the different type of force?

Answer: Gravitational force, electrostatic force, magnetic force are some of the type of force.

III. Fill in the blanks:

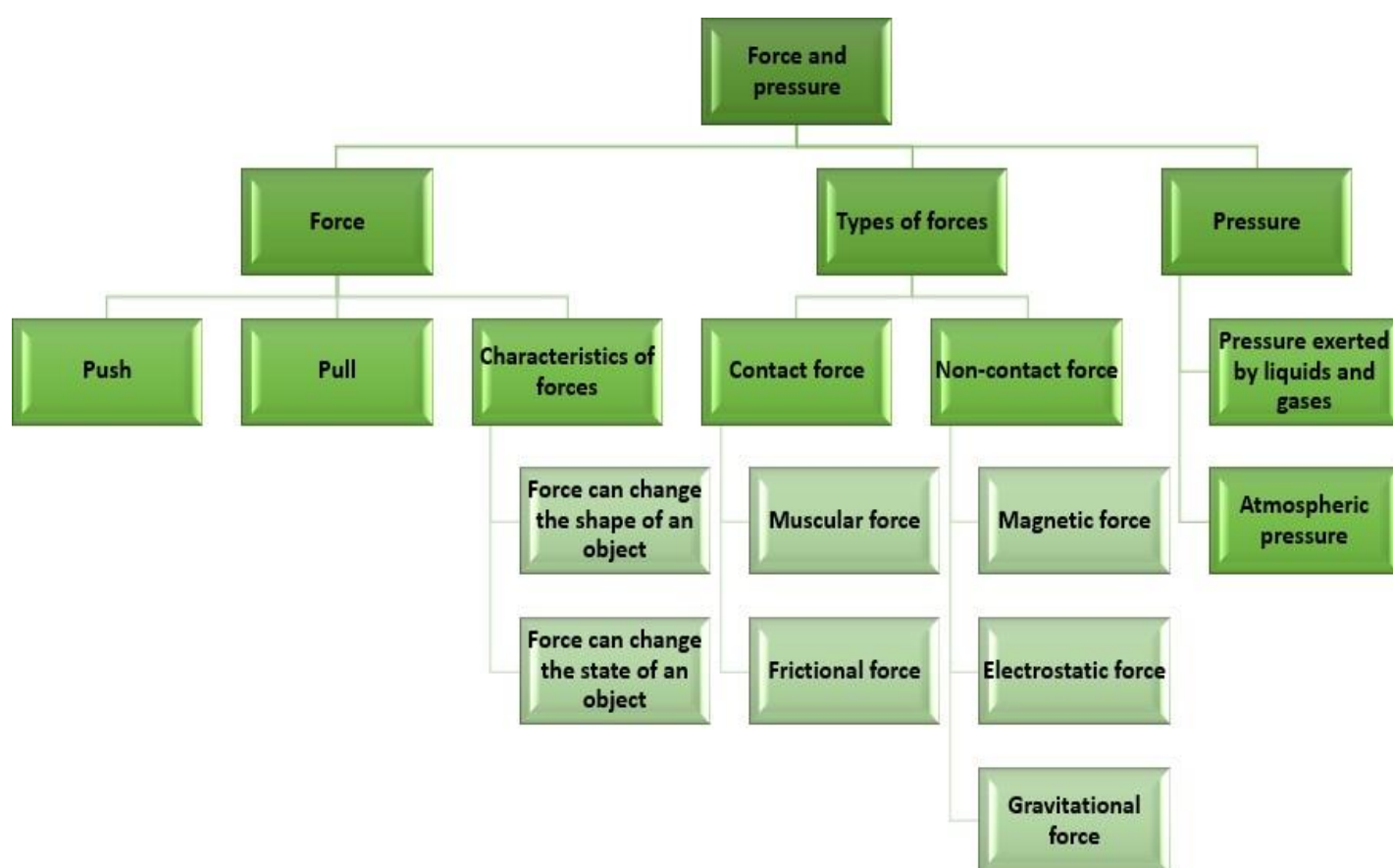
- (a) To draw water from a well we have to ——— at the rope.
- (b) A charged body ——— an uncharged body towards it.
- (c) To move a loaded trolley we have to ——— it.
- (d) The north pole of a magnet ——— the north pole of another magnet.
- (e) The direction of gravity is towards the_____.
- (f) The gravitational force of the moon is $\frac{1}{6}$ that of the_____.
- (g) Force is measured with _____.
- (h) Unbalanced forces are the results in a_____on an object that can _____.

Answers:

- a. pull
- b. attracts
- c. push
- d. repels
- e. surface of the earth
- f. earth
- g. dynamometer
- h. net force, cause changes in motion

Time to teach	Asset Type	Theme	Sub Theme
20 Minutes	Assessments	Force	Pulling and pushing forces, Forces in the same direction and in opposite direction, Force interaction, Effect of force on shape on direction of motion, Balanced and unbalanced forces , Contact and Non-contact forces

18. MS_ Summary_ Force and pressure



Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Main Script	Force	Pulling and pushing forces, Forces in the same direction and in opposite direction, Force interaction, Effect of force on shape on direction of motion, Balanced and unbalanced forces , Contact and Non-contact forces

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.