SNBP International & Senior Secondary School, Chikhali, Pune.
Affiliation No. 1130703
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NOTES (TERM-2)

CLASS: 5th | SUBJECT: Science
Prepared By: Shweta Narkhede | LESSON- L-4: Energy & force

I. Key words:

1. exerted
2. gravitational
3. electrostatic
4. repulsion
5. magnetic
6. muscular
7. frictional
8. elastic
9. catapult
10. fluorescent
11. mechanical
12. kinetic
13. potential
14. hydroelectric
15. fulcrum
16. pliers
17. wheelbarrow
18. escalator

II. Pre activity:

Write down the four main effects of force.

III. Differentiate between the following:

1. Frictional and gravitational force.

Frictional force	Gravitational force
1) Frictional force acts opposite to the direction of the motion of an object.	1) Gravitational force is the force by which the Earth pulls everything towards its centre.
2) This force always opposes movement and slows down the motion.	This force always acts in the opposite direction when an object moves away from the Earth.

2. First-class and second-class lever.

First-class lever	Second-class lever
1) First-class lever: In this type of lever, the fulcrum lies between the effort and the load.	1) Second-class lever: In this type of lever, the load is in between the fulcrum and the effort.
2) Example: Scissors, seesaw.	2) Example: Bottle opener, wheelbarrow.

3. Inclined plane and a wedge.

Inclined plane	Wedge
1) Inclined plane is a slopping surface in which one end is higher than the other.	1) Wedge consists of two inclined planes joined back to back forming a V shape.
2) It is used to lift heavy load to a height.	2) A wedge is used to cut things. Example: Knife, axe.

4. Kinetic and potential energy.

Kinetic energy	Potential energy
1) Kinetic energy is the energy that an object has due to its motion.	1) Potential energy is the energy that an object has due to its height.
2) Example: Energy in a moving car.	2) Example: Energy in a stone placed at a height.

IV. Give reasons for each of these:

1. Wheel and axle together form a simple machine that work in pair. If either of them is removed, the other one cannot function properly. Hence, if axle is removed, the wheel alone cannot work as a simple machine.

2. Magnets are used to separate scrap items made of iron or other magnetic materials.

3. Sound waves have energy that make a balloon vibrate when held in front of a sound box playing loud music.

V. Answer the questions in brief:

1. A force is a pull or a push.

2. Simple machines are tools that make our work easier and faster by applying the force at a convenient point.

3. A pulley is a simple machine that uses grooved wheels and a rope to raise, lower or move a load.

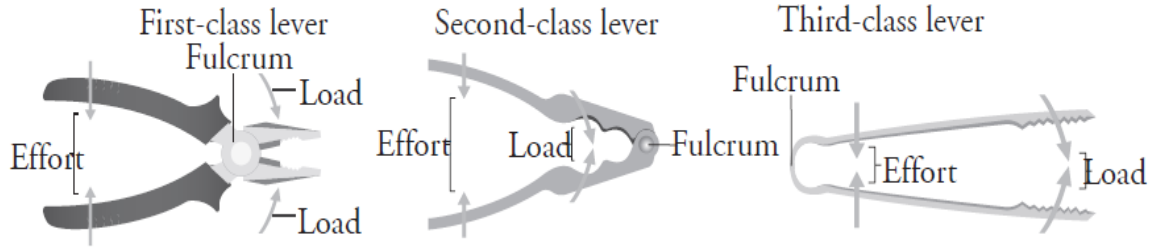
4. Electrostatic force is the force of attraction or repulsion between particles or objects due to their electric charge. It is a force exerted by a charged body on another charged or uncharged body.

5. Heat energy, sound energy, light energy, kinetic energy, mechanical energy, wind energy, electrical energy.

VI. Answer the questions in detail:

1. The energy possessed by an object due to its motion or position is called mechanical energy.
It is of two types: kinetic energy and potential energy. The energy that an object possesses due to its motion is called kinetic energy. All moving things have kinetic energy. For example, a moving car has kinetic energy due to its motion.
The energy that an object possesses due to its position is called potential energy. For example, water stored in a dam has potential energy due to its position (height).

2. A lever is a simple machine with a long rod that moves around a fixed support. A lever helps to lift heavy objects or move things with less effort. It consists of three parts: fulcrum, effort, load. There are three classes of levers: first-class, second-class, third-class lever depending up on the position of the fulcrum, load, effort.



3. Simple machines are tools that make our work easier and faster by applying the force at a convenient point, which either changes the direction or the amount of force applied. There are six simple machines: lever, pulley, inclined plane, screw, wedge, and wheel and axle.

4. Friction is a force that acts opposite to the direction of the motion of an object. Thus, friction always opposes the movement of an object and slows down motion. When two objects are rubbed against each other, they cause friction object. When we walk, friction is produced between our shoes and the ground. This friction provides a grip and prevents us from slipping. Friction between the tyres and the road allows vehicles to move steadily. Heat is produced when we rub our palms due to friction. Friction also helps to light a matchstick when rubbed against a matchbox. Without friction, we would not be able to hold anything with our hands or write with a pen.

5. A screw is better than an ordinary nail because the spiral threads grip the wood or walls tightly and do not come off easily.

VII. Out of the box:

Ans: We go upstairs against the gravitational pull of Earth. Hence, we require more efforts to overcome the gravitational pull of Earth. On the other hand, when we climb down, we do so in the direction of gravitational pull of Earth and so we do not require any extra efforts.

VIII. Post activity:

Draw and label the figure of the First-class, second-class and third-class lever. (Plier, nutcracker, tongs)

Subject Teacher H.O.D. Co-ordinator Principal