

Class V

Science

Chapter 11 - Simple Machines

1. Why do we need machines? Name some simple and complex machines that we use daily.

Ans A machine is a device or a tool that can be used to help us do work faster and more easily. Screwdriver, claw hammer, bottle opener, wheelbarrow, plier, knife, wrench, etc are simple machines. Simple machines have a few parts only and are easy to use.

Complex machines have many parts and they are made up of a number of simple machines. Washing machine, sewing machine, computer, typewriter, bicycle, etc. are complex machines.

2. Define the term lever. How many types of levers are there and what is the difference between them?

Ans A lever is a bar which moves freely about a fixed point. This fixed point is known as a supporting point or the fulcrum.

There are three different classes of levers. They are named according to the position of the effort, load and fulcrum.

First Class Levers

In such type of levers, the fulcrum (F) is located at some point between the load (L) and effort (E).

Second Class Levers

In such type of levers, the load (L) is located between the fulcrum (F) and the effort (E).

Third Class Levers

Levers in which the effort (E) is applied between the fulcrum (F) and the load (L) are called levers of the third class.

3. How do a wheel and an axle work together?

Ans A wheel and axle arrangement consists of a wheel mounted rigidly upon a rod or drum called axle. It can be used to increase force. This arrangement helps us turn something more easily or move something across a surface more easily. The movement of vehicles is possible only because of wheels. The wheel forms the machine but the wheel itself is not a machine. A wheel becomes a machine when it

comes with a rod in its center the rod is called the axle. The axle rotates when we move the wheel. So, the wheel and the axle together form a simple machine.

4. What is an inclined plane? What is it used for?

Ans An inclined plane is a simple machine. It is a slope at an angle with the horizontal surface. This slopes helps us to move an object to a lower or higher place with lesser effort. Lifting a heavy objects to a height normally needs much more effort, but an inclined plane makes this job easier. Labourers use a wooden plank to load or unload a truck. In airports, hospitals, and stations, ramps are provided to push up trolleys , wheelchairs or stretchers etc. easily.

5. What is a wedge?

Ans Wedge has two planes which meet at a sharp edge. It is very simple machine. It is used for splitting or cutting. It has one thick edge. This is the blunt edge. The other side is the thin edge. This is the sharp , cutting edge.

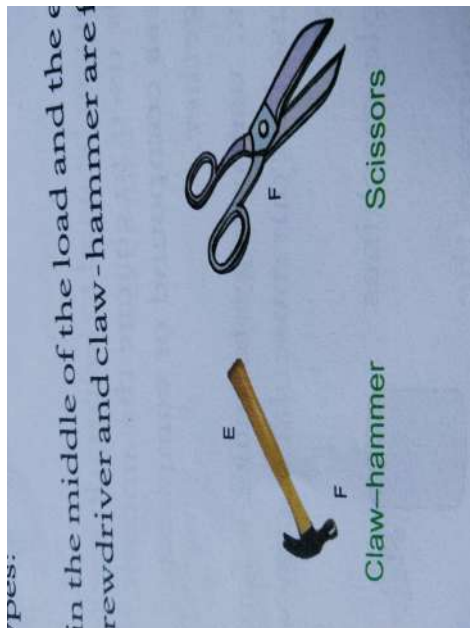
6. What is a pulley ? How does it make our work easier?

Ans The pulley is another type simple machine. It is made up of a grooved wheel with a rope or chain. A pulley can be fixed or movable. The pulley changes the direction of the force and make our work easier. Here, we lift the load up by applying a downward force.

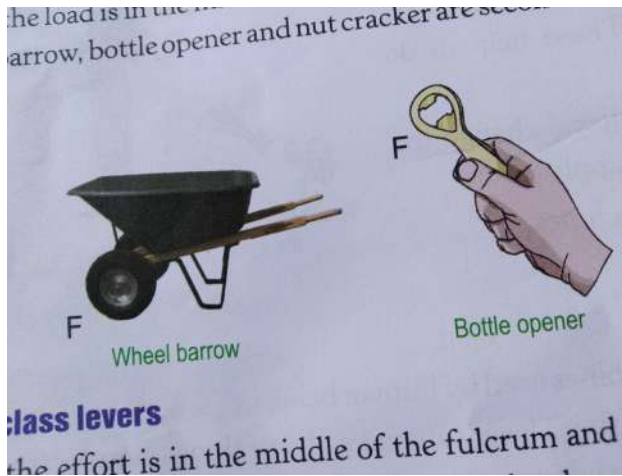
It is used in factories, farms, godowns, and garages.

7. Draw examples of the classes of levers. Show the position of fulcrum, load and effort.

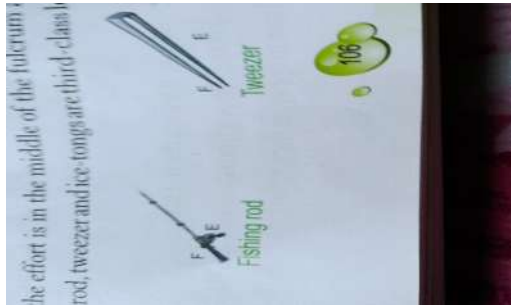
Ans First class levers



Second - class levers



Third class levers



B. Fill in the blanks

1. A machine makes our work easier and simpler.
2. A bottle opener is an example of second class lever.
3. In a **Second class lever**, the load is between the fulcrum and the effort.
4. An inclined plane is a sloping surface that pushed or pulled the effort to lift a load.
5. A pulley is a small wheel with a grooved wheel around its rope
6. A pulley helps us by changing the direction of the force.

C. True or false

1. All machines increase force - False
2. A simple pulley does not increase or decrease force - True
3. In the first class lever, load lies between the effort and the fulcrum - False

4. A steep slope makes it easier to push something up. - False
5. A needle is an example of inclined plane - False
6. Screwdriver is an example of a wheel and an axle arrangement. - True

E. Match the columns:

1. Lever - Screwdriver
2. Pulley - To take water from well
3. Screw - Sewing machine
4. Incline plane - Roads in hilly region
5. Wheel and axle - Wheel barrow
6. Wedge - Needle

F. Tick the correct answer:

1. In a first class lever , which lies in middle?

Ans Fulcrum

2. In a second class lever, which lies in the middle?

Ans Load

3. In a third class lever , which lies in the middle?

Ans Effort

4. A screw is form of

Ans Wedge

