# FORCE AND ENERGY

Class- V

# I. NEW WORDS

- stationary
- muscular
- buoyant
- lever
- machines
- inclined plane
- pulley
- energy
- renewable
- vibration
- mechanical
- kinetic

# II. DEFINE

## 1.Mechanical energy:

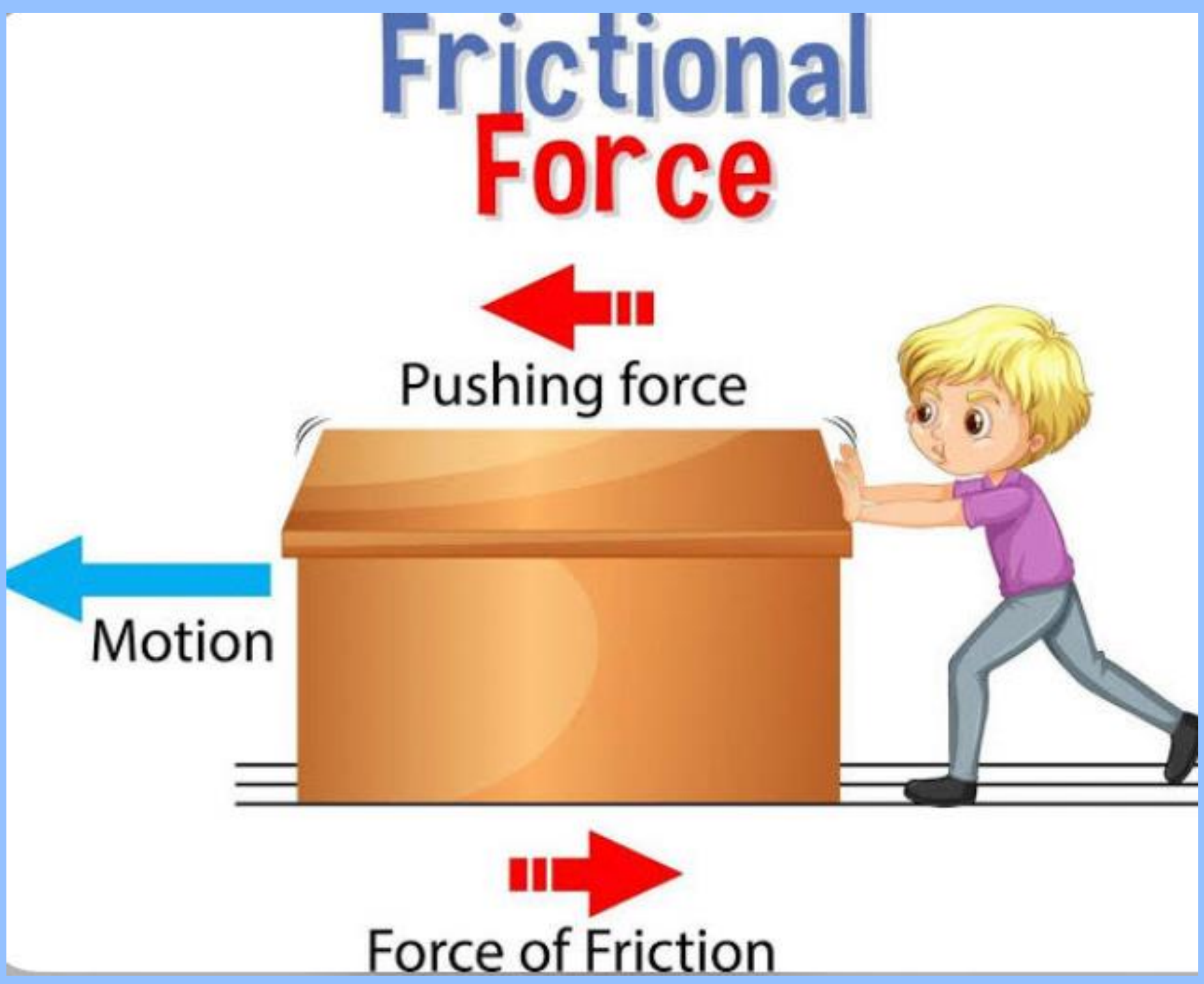
The energy possessed by an object due to its motion or position is called mechanical energy.

## 2.Screw:

A screw is an inclined plane which has grooves wrapped on it.

## 3. Frictional force:

Force generated by two surface that contacts and slide against each other.



# III. GIVE REASON WHY?

## Q1. Geothermal energy is a renewable energy.

Ans- Geothermal energy is called a renewable source of energy because there is an infinite supply of heat from the earth and requires no effort to replenish.

## Q2. Hydroelectric power plants are located on water sources.

Ans-Hydroelectric power plants are located on water sources because the source of hydroelectric power is water and it is used to generate electricity.

## Q.3You need to be more careful when you cycle down a hill than when you ride up the hill. Why?

Ans-When we go down the hill speed of the cycle increases due to gravity so we must be very careful when we go down a hill than when we go up the hill.

# IV.ANSWER THESE-

Q1. What is a lever? On What basis are levers classified.

**A lever is a simple machine consisting of a rigid rod which is capable of turning around a fixed point .**
**Levers are classified on the basis of the relative positions of load, effort and fulcrum.**

Q.2 What is an inclined plane? How it is useful for us?

**An inclined plane is a simple machine in which a sloping or tilted surface is used to lift heavy loads with less efforts. Inclined planes are widely used in the form of loading ramps to load and unload goods on truck , ships and other planes.**

Q.3 What does the law of conservation of energy state?

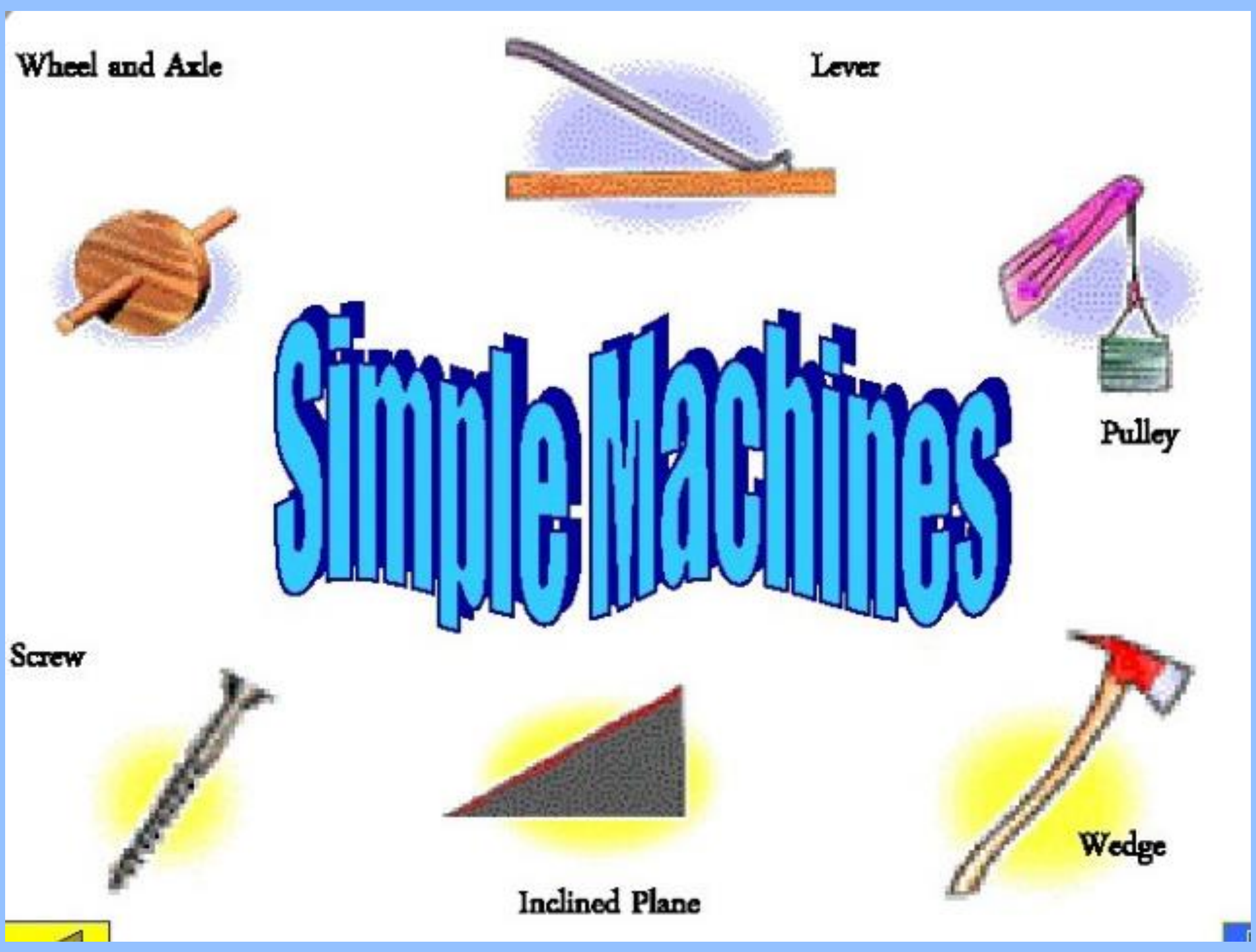
**The law of conservation of energy states that Energy can neither be created nor be destroyed; Although it may be transformed from one form to another .**

# Q.4 How is wind energy more environment friendly than heat energy?

**Wind energy is a renewable energy source clean and non polluting whereas heat energy is obtained by the burning of fossil fuels like coal, kerosene and petrol.**

# Q.5 What are simple machines? Give examples.

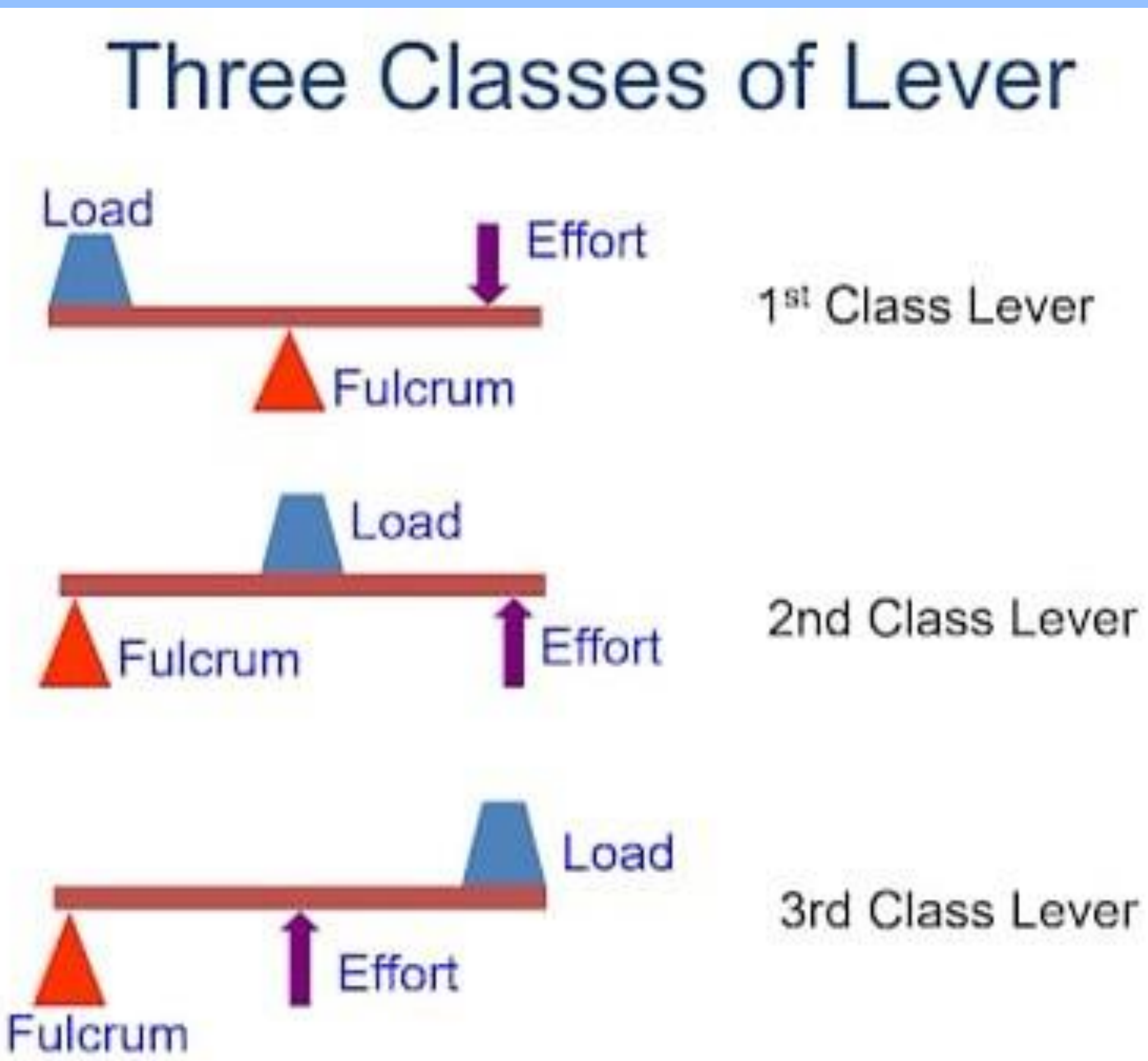
**Simple machines are tools which make our work easier and faster.**
**examples- lever, inclined plane , wheel and axle , pulley , screw.**



# V. DRAW AND LABEL

- *position of load, fulcrum and effort in three*

*Types of levers*



# Force and Energy

## Get started!

**Circle the correct answers.**

1. A hammer is an example of ( lever / pulley / screw ).
2. A ( pulley / lever / screw ) is made from a wheel and a rope.
3. A ( screw / pulley / wedge ) is shaped like two inclined planes attached back to back.

## CHECKPOINT

ENRICHMENT ACTIVITY

**Circle the correct answers.**

1. A pair of scissors uses ( mechanical / frictional / muscular ) force to cut something.
2. When the fulcrum is in between the load and the effort, it is a ( first-class / second-class / third-class ) lever.
3. A ( pulley / screw / lever ) is a small wheel with a groove around its outer edge.

## Read and ANSWER

### A. Tick (✓) the correct answers.

1. We are able to stay on the ground because of
   a. earth's gravitational force. ✓
   b. buoyant force. ___
   c. elastic force. ___
   d. frictional force. ___
2. A screwjack used to lift a car is a
   a. first-class lever. ___
   b. second-class lever. ___
   c. pulley. ___
   d. screw. ✓
3. The most readily available source of energy is
   a. wind energy. ___
   b. geothermal energy. ___
   c. solar energy. ✓
   d. water energy. ___
4. The upward push of water on a floating object is called
   a. buoyant force. ✓
   b. volume. ___
   c. density. ___
   d. pressure. ___

### B. Fill in the blanks.

1. Most simple machines make use of mechanical force.
2. There is no gravitational force in space.
3. Simple machines change the direction of applied force.
4. A moving car possesses mechanical energy due to its motion
5. An inclined plane is a Slope which makes work easier.

### C. Change the underlined words to correct these statements.

1. A stretched rubber band regains its original position on being released because of gravitational force. elastic
2. Geothermal energy is a non-renewable source of energy. renewable
3. The pulley used for drawing water from a well is a movable pulley. fixed
4. Simple machines make our work difficult. easier
5. We are able to walk because of elastic force. frictional force

### D. Write short answers.

1. Name the different types of forces. frictional force, elastic force
2. What are simple machines?
3. Why is geothermal energy referred to as a renewable source of energy?
4. Where does most of the heat energy come from?
5. Name four different forms of energy. Solar, Wind, light, heat
6. Give some examples of lever. plier, hammer, bottle opener, wheel barrow.

### E. Answer these questions.

1. What is a lever? On what basis are levers classified?
2. What is an inclined plane? How is it useful for us?

# WORKSHEET 1

## FORCE AND ENERGY

**A. Fill in the blanks.**

1. A rolling ball stops after some time because of the frictional force
2. Simple machines are tools which make our work easier and faster.
3. To cut paper we use the mechanical force of scissors.
4. Ramps in hospitals are examples of inclined plane

**B. Match the columns.**

| | |
|---|---|
| 1. Mechanical energy | a. near a water source (5) |
| 2. Solar energy | b. readily available and non-polluting (2) |
| 3. Geothermal energy | c. kinetic or potential (1) |
| 4. Wind energy | d. produced inside the earth (3) |
| 5. Hydroelectric power plant | e. plentiful and renewable (4) |

**C. Answer these questions.**

1. What is force?
2. What are simple machines?
3. What is an inclined plane?
4. What is geothermal energy?

**D. Give reasons for the following.**

1. We are able to stay on the ground.
2. Hydroelectric power plants are located on water sources.
3. We cannot create energy.

# WORKSHEET 2

## FORCE AND ENERGY

**A. Fill in the blanks.**

1. Astronauts float in space because there is no gravitational force.
2. When we use a catapult we use elastic force.
3. When the load is in between the fulcrum and the effort, it is a second class lever.
4. Walking up a slope is easier then climbing a ladder to the same height.
5. Screw is a simple machine used to hold things tightly together.

**B. Give two examples of the following.**

1. First-class lever pliers, hammer
2. Second-class lever nutcracker, bottle opener.
3. Third-class lever fishing rods, tweezers.

**C. Answer these questions.**

1. What is meant by 'buoyant force'?
2. What is the 'fulcrum' in a lever?
3. What is the purpose of using a pulley?
4. What is 'Law of conservation of energy'?

**D. Give reasons for the following.**

1. We are able to walk.
2. A screw is better than a nail.
3. Geothermal energy is a renewable energy.