Kasthalab-1 Worksheet: Fixed Pulley

A. Objective:

To calculate the M.A, V.R, and efficiency of a single fixed pulley

B. Materials:

- Kasthalab-1
- Weights
- Spring balance or force sensor
- Ruler or tape measure

C. Procedure:

1. Attach a known load to the load hook of the Kasthalab-1 pulley.
2. Use a spring balance to lift the load steadily.
3. Record the effort (force applied) and measure the distance moved.

D. Observations:

Load (N)	Effort (N)	M.A = Load / Effort	V.R	Efficiency (%) = (M.A / V.R) × 100
			1	

E. Reflection:

1. Was the pulley system easier to use than lifting the load directly? Why or why not?
2. What factors might reduce the efficiency of the pulley?
3. How could this be useful in real-world applications?

Kasthalab-1 Worksheet: Wheel and Axle

A. Objective:

To determine the M.A, V.R, and efficiency of a wheel and axle.

B. Materials:

- Kasthalab-1
- Load and effort weight
- Measuring tools

C. Procedure:

1. Attach the wheel and axle with string wound around both.
2. Hang the load on the axle side, apply effort on the wheel side.
3. Measure radius of wheel and axle, force applied, and distance moved.

D. Observations:

Load (N)	Effort (N)	Radius of Wheel (cm)	Radius of Axle (cm)	M.A = Load / Effort	V.R = R/r	Efficiency (%) = (M.A / V.R) × 100

E. Reflection:

1. Why does using a larger wheel reduce the effort?
2. Could you improve this system further?
3. Can you think of devices that use wheel and axle in daily life?

Kasthalab-1 Worksheet: Inclined Plane

A. Objective:

To calculate the M.A, V.R, and efficiency of an inclined plane

B. Materials:

- Kasthalab-1
- Load object
- Spring balance
- Ruler

C. Procedure:

1. Place the load at the bottom of the ramp.
2. Pull the load up slowly using a spring balance.
3. Measure length of ramp and height from which load is lifted.

D. Observations:

Load (N)	Effort (N)	Ramp Length (m)	Height (m)	M.A	V.R = Length / Height	Efficiency (%) = (M.A / V.R)

E. Reflection:

1. Was the inclined plane helpful? Explain.
2. What happens to the effort needed as the slope increases?
3. Where do you see inclined planes in your environment?

Kasthalab-1 Worksheet: Lever

A. Objective:

To observe and verify the principle of levers

B. Materials:

- Kasthalab-1
- Load and effort weights

C. Procedure:

1. Set up the lever on the fulcrum using Kasthalab-1.
2. Position the load and effort on the lever arm according to the lever class you want to test.
3. For each class of lever:
    - Measure and record the load (N) and effort (N).
    - Measure the distance from the fulcrum to the load (load arm) and to the effort (effort arm).
    - Calculate the moments by multiplying load × load arm and effort × effort arm.
4. Change the fulcrum position to switch between lever classes and repeat the measurements.

D. Observations:

Class of lever	Load (N)	Effort (N)	Load Arm	Effort Arm	Load × Load arm	Effort × Effort arm	Remarks
1st							
2nd							
3rd							

E. Reflection:

1. What happened when the effort arm was longer?
2. How does the position of the fulcrum affect efficiency?
3. Can you categorize the levels (Class 1, 2, or 3)?