

Part 5– Screw

1. Label the drawing of Screw (C_E OR Circumference_{Effort}, Pitch, F_E , F_R)



2. Measure the length of one of the blocks & count the number of teeth. Use these two values to calculate the pitch of the screw.

Length of block: _____

Number of Teeth: _____



The Pitch of the Screw is: _____

3. Measure the diameter or radius of the wheel where the effort force is going to be applied. Use that measurement to calculate the circumference of the wheel.

Radius: _____

Diameter: _____

Circumference where Effort is applied: _____

4. Calculate the ideal mechanical advantage of the screw when your effort force is applied to the head (wheel).

5. Your resistance force (the weight) for the other four simple machines you have built is now going to be used as the effort force.

Record the value of the effort force here:

$$F_{E_{actual}} = \text{_____} \text{ (see Part 0)}$$

6. Predict (by calculating it) the amount of resistance force you can overcome in “ideal conditions” by applying the effort force recorded above. (*hint: Use $AMA = IMA$*).

$$F_{R_{predicted}} = \text{_____}$$

7. Use a force sensor to measure the actual output resistance force required when you use the screw.

$$F_{R_{actual}} = \text{_____}$$

8. Calculate the actual mechanical advantage of the screw system

9. Calculate the efficiency of the screw system when your effort force is applied.

Please explain why you think your screw has the efficiency you just calculated.

10. Why do you think overcoming a resistance force using a screw is so easy?