

Name: _____

Pd: _____

Date: _____

Simple Machines/Mechanical Advantage/Efficiency

Essential Questions: _____ how simple machines, such as inclined planes, pulleys, levers and wheel and axles, are used to create mechanical advantage and increase efficiency.

Definitions:

Energy:

Work:

Force:

Work is done when a _____ on _____ and moves it a _____

- Work = _____
- The unit for work is the _____ (N·m)

WORK PROBLEMS:

How much work is being done by a weightlifter below that applies 500 Newtons of force lifting a mass 2.0 meters?

How much work is being done by a weightlifter below that applies 1000 Newtons of force but does not move the mass?

_____ is done if the object _____ travel a distance

According to the scientific definition, what is work and what is not?

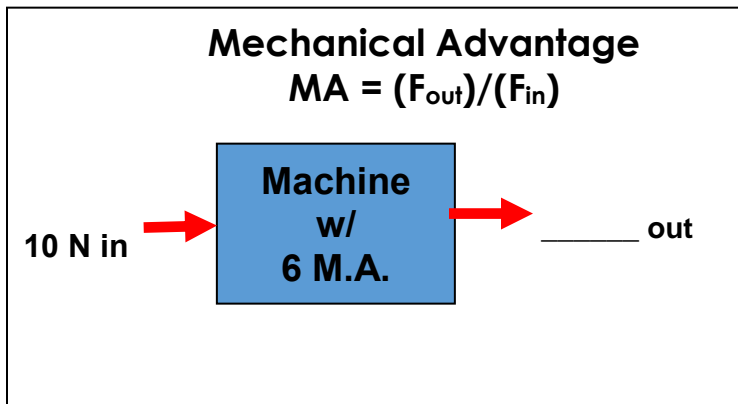
Scenario...	WORK	NOT WORK
a teacher lecturing to her class		
a mouse pushing a piece of cheese with its nose across the floor		
A scientist delivers a speech to an audience of his peers.		
A body builder lifts 350 pounds above his head.		
A mother carries her baby from room to room.		
A father pushes a baby in a carriage.		
A woman carries a 20 kg grocery bag to her car?		

MEASURING THE BENEFITS: Mechanical Advantage

_____ = how many _____ force you get out of a simple machine

Simple machines _____ the mechanical advantage

EXAMPLE: A mechanical advantage of 6 means the machine outputs 6 times more force



Mechanical Advantage:
What does it mean?

Mechanical Advantage = _____

- **There is _____ to using the machine**

Mechanical Advantage _____

- **The machine makes work _____**

Mechanical Advantage _____

- **The machine makes work**

Efficiency

- _____
- What would improve the efficiency of a machine? (Hint: What reduces friction?)

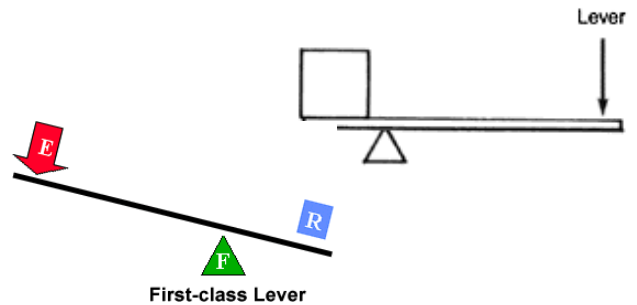
Simple Machines

A device that helps make _____ to perform by accomplishing one or more of the following functions:

- _____ from one place to another,
- _____ of a force,
- _____ of a force, or
- _____ or speed of a force.

LEVERS

- A rigid bar that _____ around a _____ called the _____.
- The bar may be either _____ or _____.
- In use, a lever has both an _____ (or _____) force and a _____ (_____ force).
- The _____ force moves; NOT the _____ force



EXAMPLES OF LEVERS (INCLUDE NAME & DRAWING)

WHEEL & AXLE

Has a _____ secured to a _____ or _____, called an axle.

- When _____ the wheel or axle _____, the _____. One full _____ of either part _____ one full revolution of the _____ part.

EXAMPLES OF WHEEL & AXLE (INCLUDE NAME & DRAWING)

PULLEY

Consists of a _____ that _____ in a _____ called a _____.

- A pulley can be used to simply _____ of a force or to gain a _____, depending on how the pulley is arranged.
- A pulley is said to be a _____ pulley if it _____ rise or fall with the load being moved.
 - A fixed pulley _____ of a force; however, it _____ create a mechanical advantage.
- A _____ pulley _____ and _____ with the load that is being moved. A _____ moveable pulley _____ a mechanical advantage; however, it _____ change the direction of a force.

EXAMPLES OF PULLEYS (INCLUDE NAME & DRAWING)

INCLINED PLANE

is an even _____ surface (_____).

- The inclined plane makes it _____ a weight from a lower to higher elevation.

EXAMPLES OF INCLINED PLANES (INCLUDE NAME & DRAWING)

WEDGE

is a _____ of the _____ plane.

Wedges are used as _____ or _____ devices.

EXAMPLES OF WEDGES (INCLUDE NAME & DRAWING)

SCREW

Also a _____ of the _____ plane.

- _____ of the screw are like a type of _____ (or _____ plane)

EXAMPLES OF SCREWS (NAMES & DRAWINGS)

