

SIMPLE MACHINES

- Most people think of complex, technical, or electronic gadgets with motors..., but machines can be much **SIMPLER**.
- A machine is any device that lets you do **WORK** in an EASIER or BETTER way.

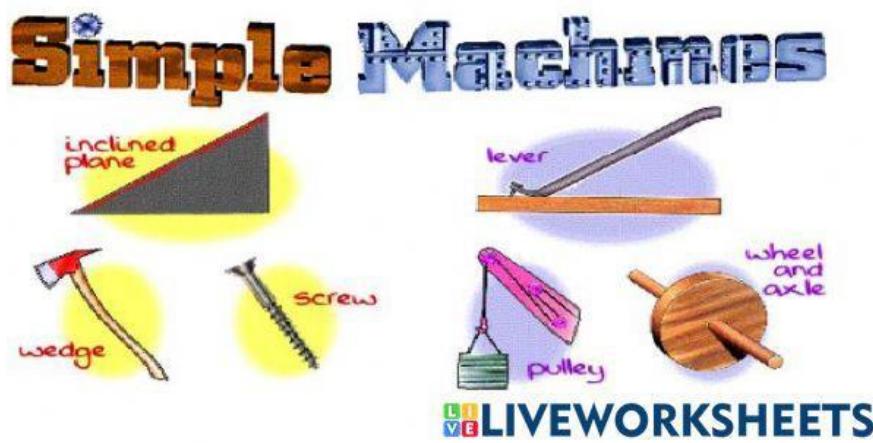
Machines make work easier by changing 3 things about the FORCE:

- The amount of force
- The distance of the force
- The direction of the force
- Basically:
Simple machines make work EASIER.

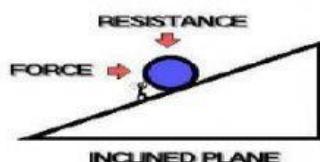
What are SIMPLE MACHINES?

- There are only 6 basic simple machines that make work easier:

- Inclined Plane
- Wedge
- Screw
- Lever
- Wheel & Axle
- Pulley



SIMPLE MACHINES	WHAT IT IS	HOW IT HELPS US WORK	EXAMPLES
LEVER	A stiff bar that rests on a support called a fulcrum	Lifts or moves loads	Nail clipper, shovel, nutcracker, seesaw, crow-bar, elbow, tweezers, bottle opener
INCLINED PLANE	A slanting surface connecting a lower level to a higher level	Things move up or down it	Slide, stairs, ramp, escalator, slope
WHEEL AND AXLE	A wheel with a rod, called an axle, through its center; both parts move together	Lifts or moves loads	Doorknob, pencil sharpener, bike
PULLEY	A grooved wheel with a rope or cable around it	Moves things up, down, or across	Curtain rod, tow truck, mini-blind, flag pole, crane



INCLINED PLANE: Examples

- Ramps (Boat ramps, wheelchair ramps)
- Ladders/Stairs



LEVERS: Examples & Uses

First Class Levers:

- Scissors, See-saws, Pliers



Second Class Levers:

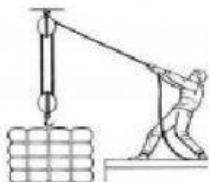
- Staplers, Nutcrackers, Wheelbarrows



Third Class Levers

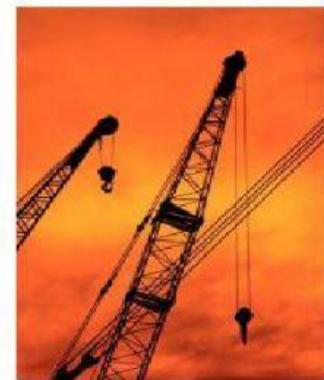
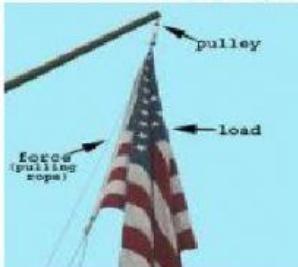
- Shovels, baseball bats, tweezers





PULLEY: Examples & Uses

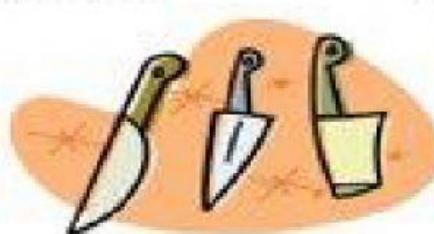
- Cranes
- Raising a flag on a pole
- Window Blinds
- Raising a sail on a boat
- Clothesline



WEDGE: Examples & Uses



- Ax, Knife, etc.
- Zippers



- Used in all cutting machines (to split materials apart)

WHEEL & AXLE: Examples & Uses

- Screwdriver
- Windmill
- Cars/Bicycles
- Rolling Pin
- Door Knob
- Fan



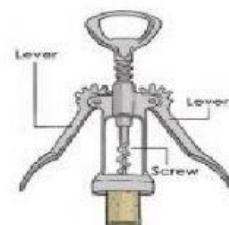
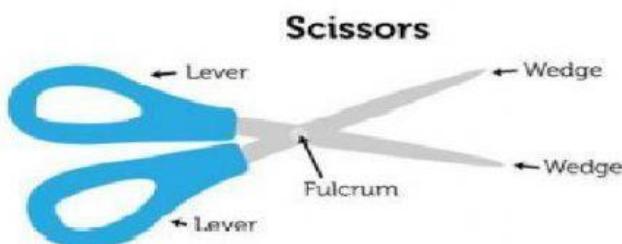
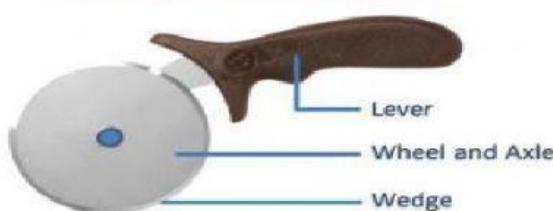
SCREW: Examples & Uses

- Screws can hold things together or lift materials.
- Screws
- Screw top lids for jars/bottles
- Light bulb
- Swivel stools/chairs



COMPOUND MACHINES

Compound Machines - are made of combinations of two or more simple machines.



Compound Machines

two or more simple machines working together

wheelbarrow A diagram of a wheelbarrow with labels: 'levers' pointing to the handle and the wheel, and 'wheel & axle' pointing to the wheel.	pencil sharpener A diagram of a blue pencil sharpener with labels: 'lever' pointing to the handle, 'wedges (inside)' pointing to the internal mechanism, and 'wheel & axle (inside)' pointing to the internal wheel and axle.	crane A diagram of a yellow construction crane with labels: 'pulley' pointing to the pulley system, 'lever' pointing to the long arm, and 'wheel & axle' pointing to the wheel and axle at the base.
bulldozer A diagram of a yellow bulldozer with labels: 'wedge' pointing to the blade, 'lever' pointing to the arm, and 'wheel & axle' pointing to the wheel and axle.	clippers A diagram of a pair of red-handled clippers with labels: 'wedges' pointing to the cutting edges, and 'levers' pointing to the handles.	escalator A diagram of a blue escalator with labels: 'pulleys (inside)' pointing to the pulley system, and 'inclined plane' pointing to the steps.