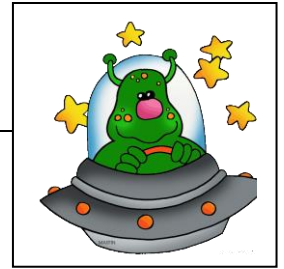


Week 31 – SCIENCE NOTE PAGE

Compound Machines



Simple vs. Compound Machines

- **Remember**, a SIMPLE machine makes work easier when **ONE** force is applied; the work is done with **ONE** movement.
- **Compound Machines** - a machine formed from **two or more** simple machines.
 - **Compound machines** make work easier by changing the **strength** or **direction** of a force
 - Compound machines may involve **more than one movement** and **more than one force**
 - Compound machines may be made of more than one of the same simple machine or more than one type of simple machines
 - **Examples:** bicycles, zippers, can opener, scissors, wheel barrow

Bike Parts are Simple Machines

- A **bicycle** also combines several different types of simple machines to do work.
 - **Wheels and Axles** - The wheels of a bicycle are wheels and axles.
 - **Levers** - The pedals are part of a lever. The gearshifts and brake controls on the handlebars are levers, too.
 - **Pulley** - The lever with the pedals turns a pulley that holds the bicycle's chain.
- What happens if one of the simple machines is not working in a compound machine, like a bicycle?
If one of the simple machines is not working on the bike, the bike won't move or it will not be safe to ride the bike.



More Compound Machines

- A **can opener** is made up of **THREE** different simple machines:
 - (1) **Wedge** (2) **Wheel & Axle** and (3) **Levers**
- **Scissors** – use **two** levers and **two** wedges
- **Wheel barrows** – use two simple machines: (1) **lever** and (2) **wheel and axle**



Work, Force, & Distance in Compound Machines

- **Work** is represented by the equation $W = Fd$.
 - To complete the same amount of work, you can **decrease** the amount of force you need to use by spreading it over a longer distance.
 - Or, you can decrease the amount of distance you need to cover by **increasing** the amount of force you use.
- In COMPOUND MACHINES, for example:
 - A pair of **scissors** = **long blades + short handle**
 - good for cutting paper and fabric because you need little force and a long cut
 - A pair of **dikes** = **short blade + long handle**
 - good for cutting sheet metal and heavy materials because you need a LOT of force and a short cut

