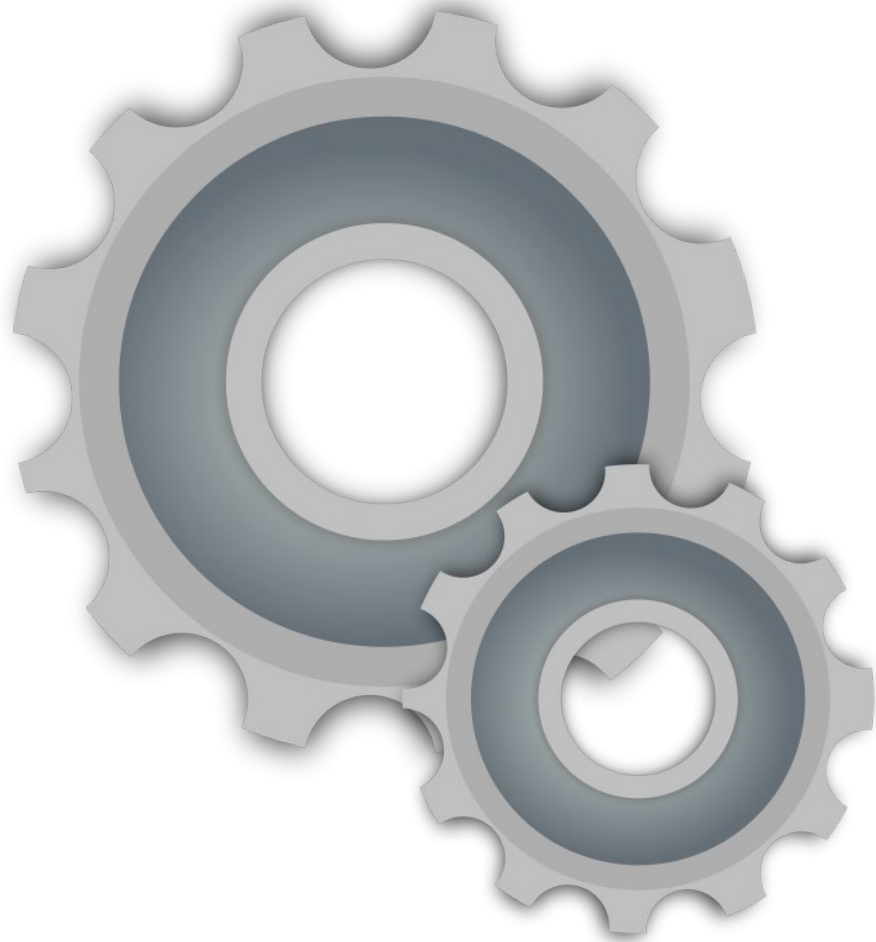


GEARS

- ⦿ A gear is a round wheel that has teeth (cogs) that mesh with other gear teeth. This allows force to be transferred without any slippage.
- ⦿ Depending on gear construction and arrangement, gear devices can transmit forces from the power source at different speeds, different torques, or in a different direction.



TYPES OF GEARS

- ◉ Spur gears
- ◉ Bevel gears
- ◉ Rack and pinion gears
- ◉ Worm gears

1. SPUR GEARS

- ◉ Most common type of gear
- ◉ When one gear is meshed with another, the gears will turn in opposite directions from each other.
- ◉ The driver gear provides the input movement and the driven gear gives the output movement.

MECHANICAL ADVANTAGE IN GEAR SYSTEMS

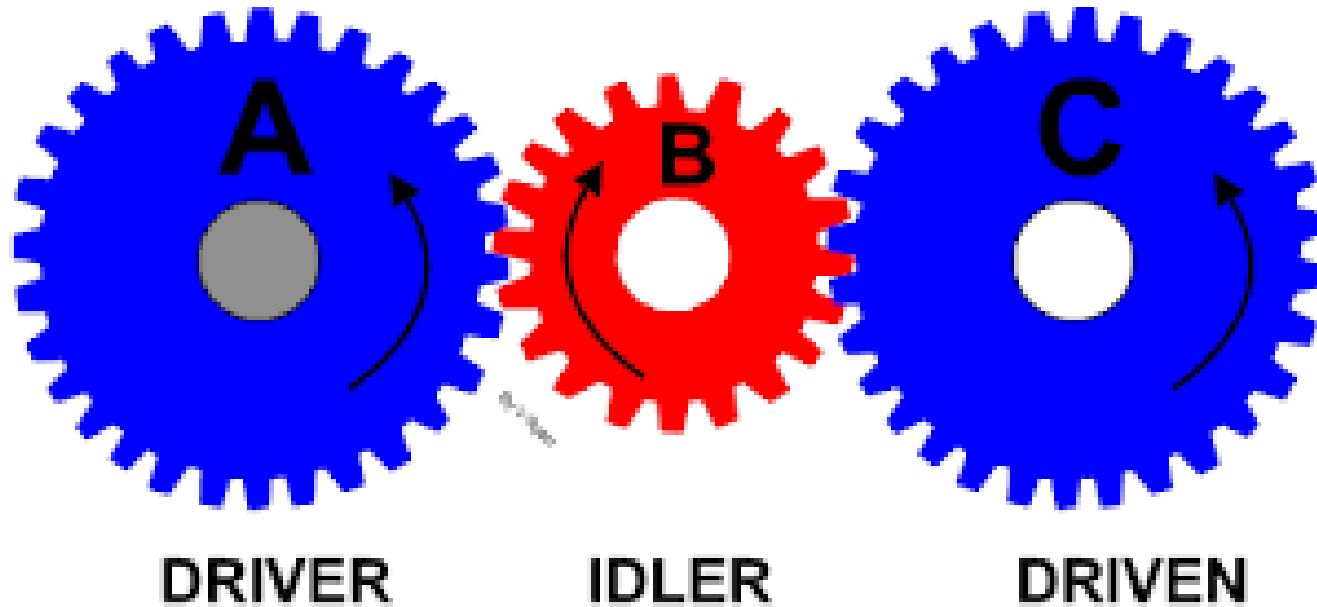
- ⦿ Mechanisms make work easier for us.
- ⦿ They change the speed, direction or force in a system so that some kind of work may be performed.
- ⦿ Gearing up is when the large driver gear turns the small driven gear, resulting in the driven gear turning or rotating faster than the driver gear.

- ⦿ Gearing down is an arrangement of the gears in which the small driver gear turns a large driven gear resulting in the large gear rotating slower.

SPUR GEARS USING AN IDLER TO SYNCHRONISE ROTATION:

- ⦿ Gears rotate in different directions and in order for them to rotate in the same direction we need another gear in between the two gears to change the direction of movement.
- ⦿ The idler gear will only change the direction of movement and not the speed of the gears. As a result of both gears rotating at the same speed, we can now say that the rotation of both gears is synchronised.

DRAW...



2. BEVEL GEARS

- Bevel gears are gears where the axes of the two shafts intersect and each gear is shaped like a cone.
- Used when the direction of a shaft's rotation needs to be changed.
- Usually mounted on shafts that are 90° to each other, but can be designed to work at other angles as well.

- ⦿ Bevel gears change the direction of movement.
- ⦿ Can be used in train engines, motor vehicles, printing presses, steel plants and railway track inspection machines.



- ⦿ Disadvantages of the bevel gear are that any gear can only work with its complementary gear or partner and no other.
- ⦿ Bevel gears must also be mounted correctly.

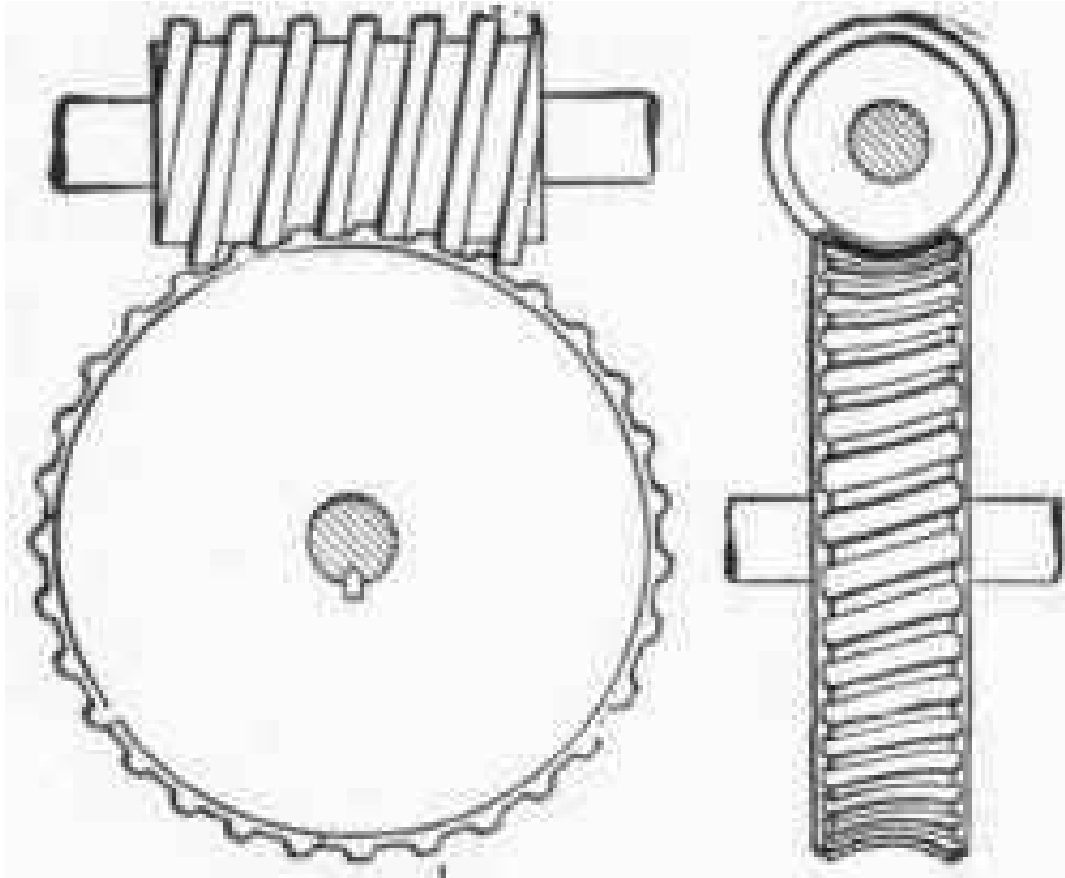
3. RACK AND PINION GEARS

- ⦿ A rack-and-pinion changes the linear motion to a rotary motion or vice versa.
- ⦿ The rack is a flat gear whose teeth mesh with the teeth of a round gear called the pinion. The pinion is fixed to a shaft.
- ⦿ An example of a rack-and-pinion gear system is the steering system on most cars.

4. WORM GEAR

- ⦿ A worm gear system is used to obtain a large increase in force and a large decrease in speed.
- ⦿ A small force turning the worm is turned into a large force turning the gear wheel.
- ⦿ Made up of a cylinder with the spiral groove mounted on a shaft. This is called the worm shaft and a gear called the worm wheel meshes with the spiral groove on the cylinder.

WORM GEAR ...

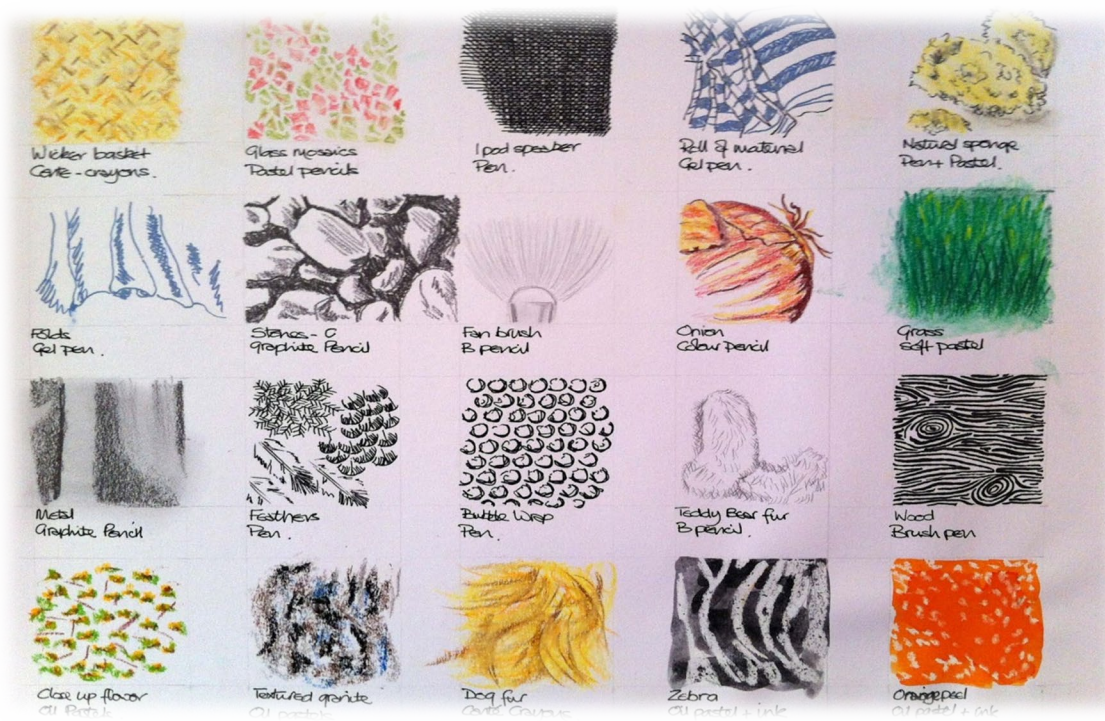


GRAPHIC COMMUNICATION

- ◉ Computer aided drawings give the draughtsman and architect additional resources to use colour, shadows and textures when making drawings

TEXTURE

- The factors that contribute to the atmosphere of a room or house include surface feel of the walls and floors and the texture of furnishings and fittings.



COLOUR

- ◉ Colour is important in your presentation graphics because it conveys your feeling or mood.
- ◉ Can also be used to convey information.



SHADOWS...



SHADOWS

- ◉ Artistic drawings need to be as realistic as possible.
- ◉ We use shadows to make sure that our drawings show an object as it really is.
- ◉ Shadows must be drawn correctly otherwise your drawing will lack realism.