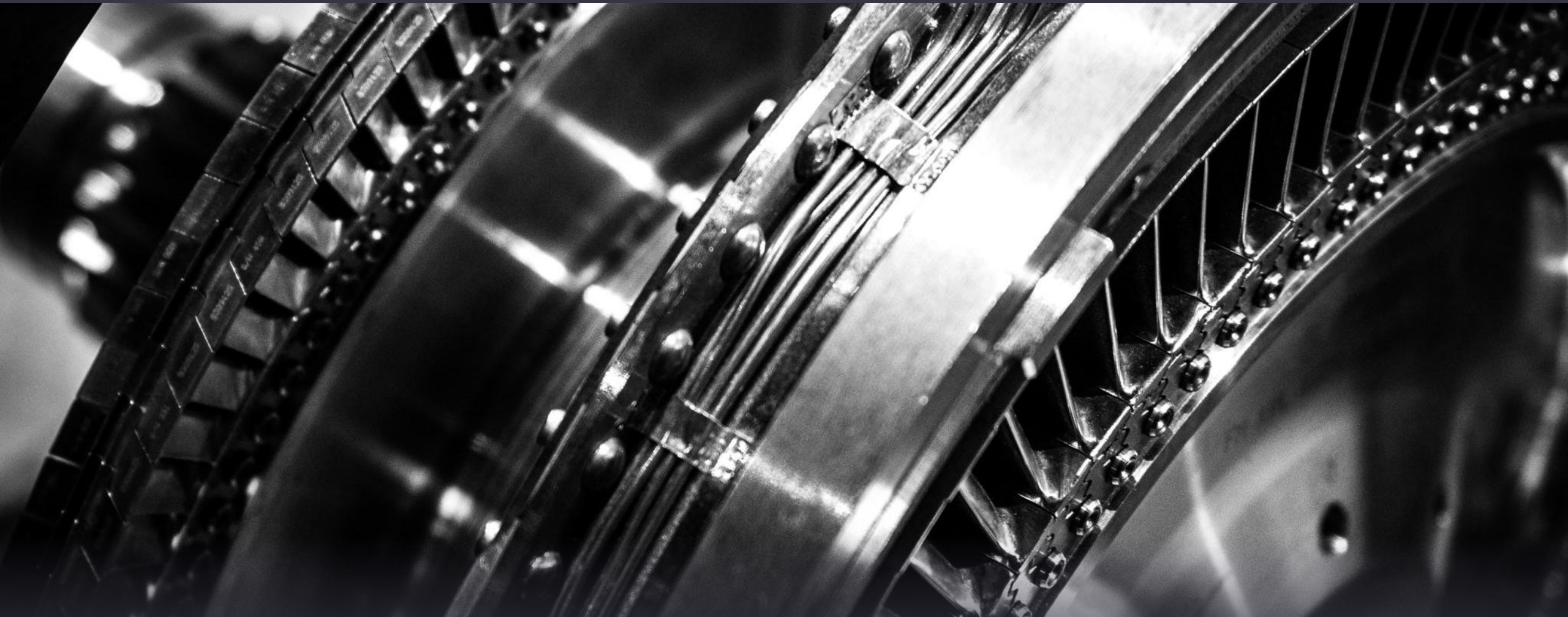
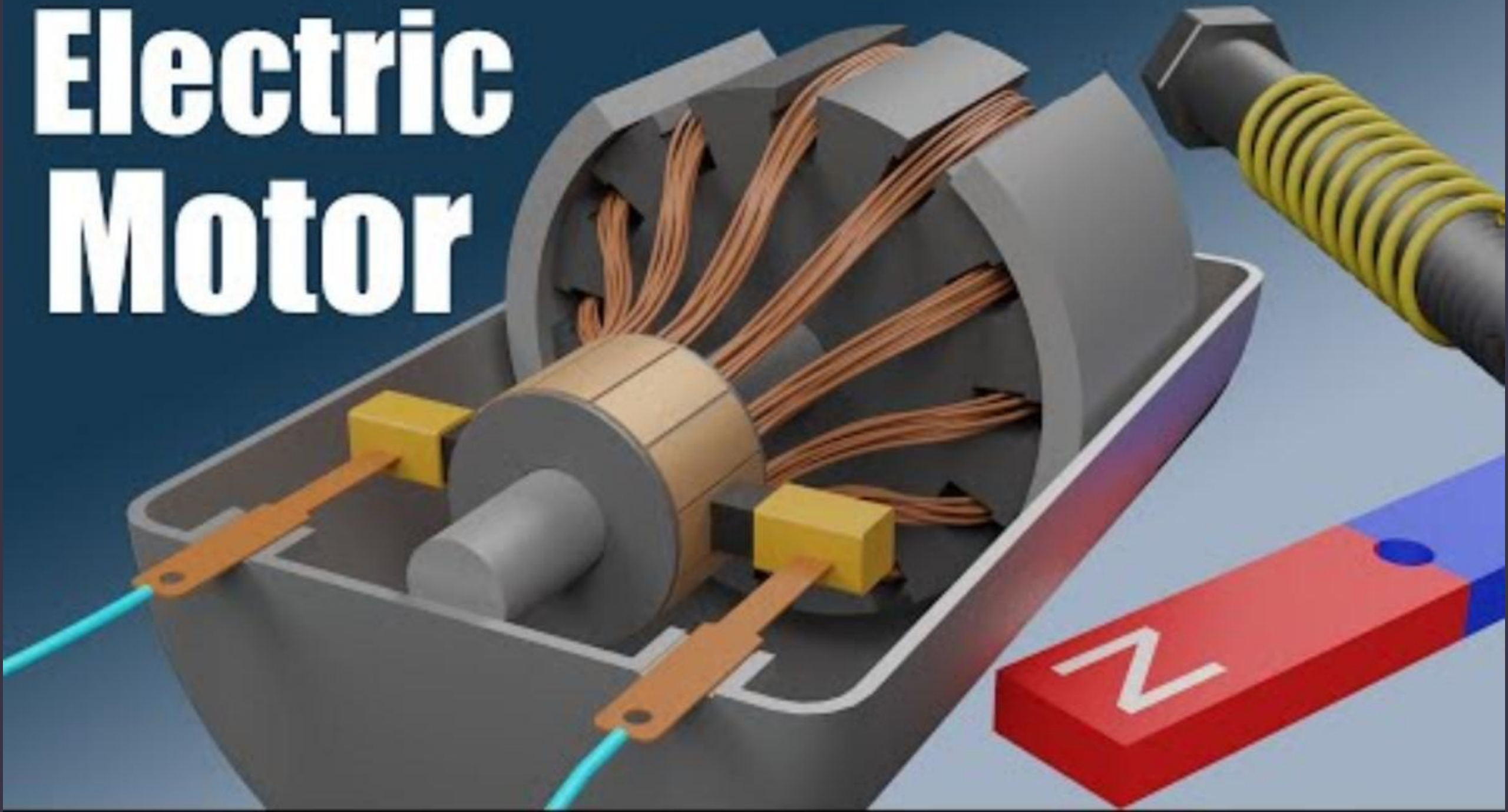


Lesson 7.5 - Electric Motors

Unit 7: Magnetism

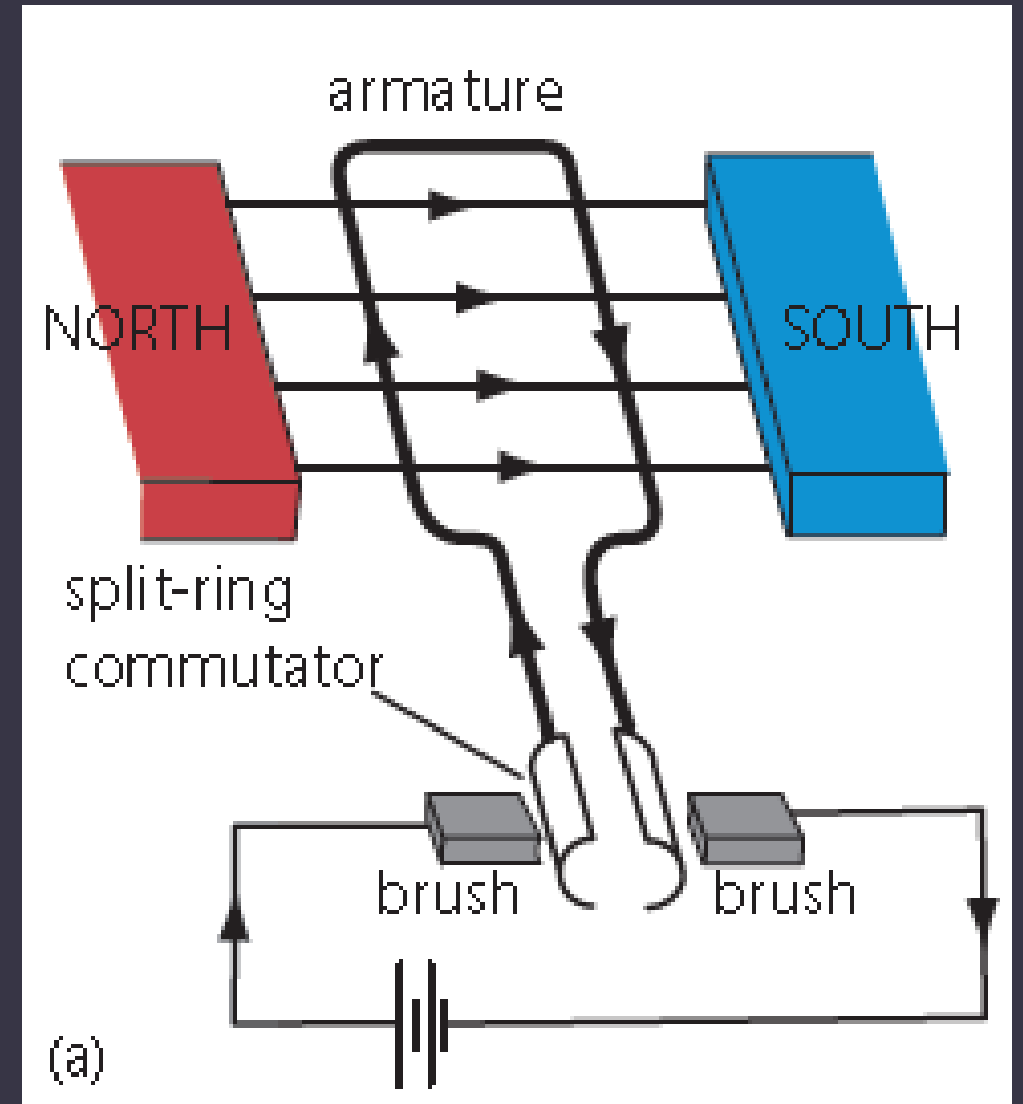


Electric Motor



Electric Motors – Basic Components

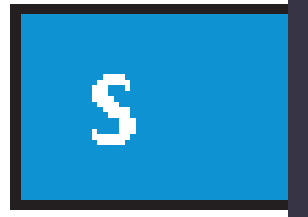
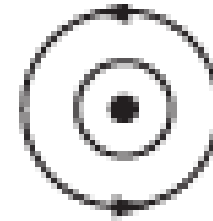
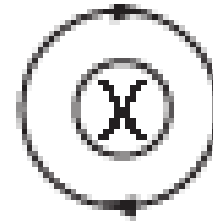
- **Armature** (coil)
 - Current-carrying wire
 - Rotates
- Magnetic field
 - From permanent or **electromagnet**
- Split-ring commutator
 - **Reverses current**



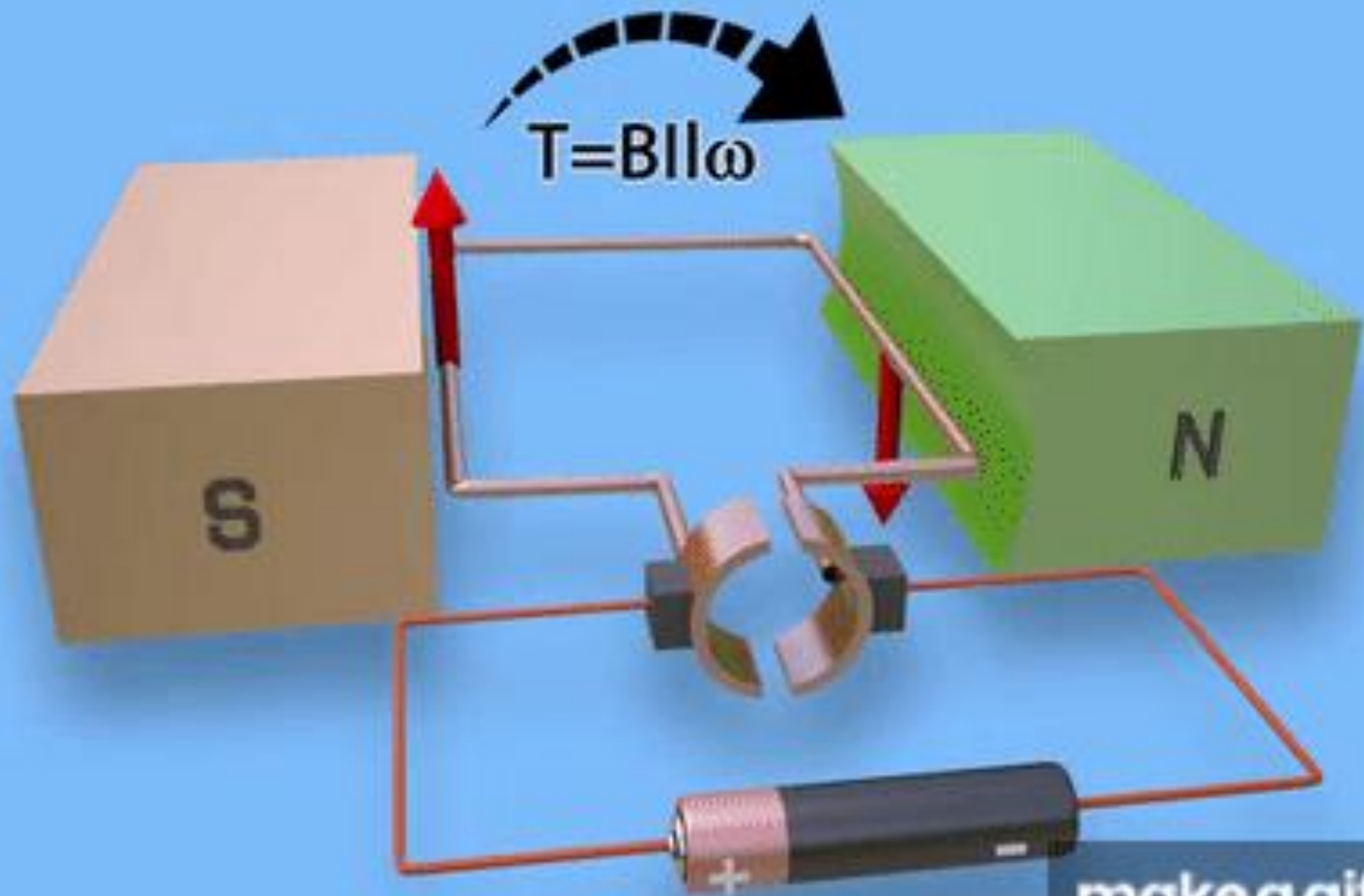
Magnetic Forces in a Motor

- **Right-hand rule** → gives force direction
- Magnetic field creates **torque** → armature rotates
- Commutator reverses current → keeps **rotation** going

line of force of external magnet

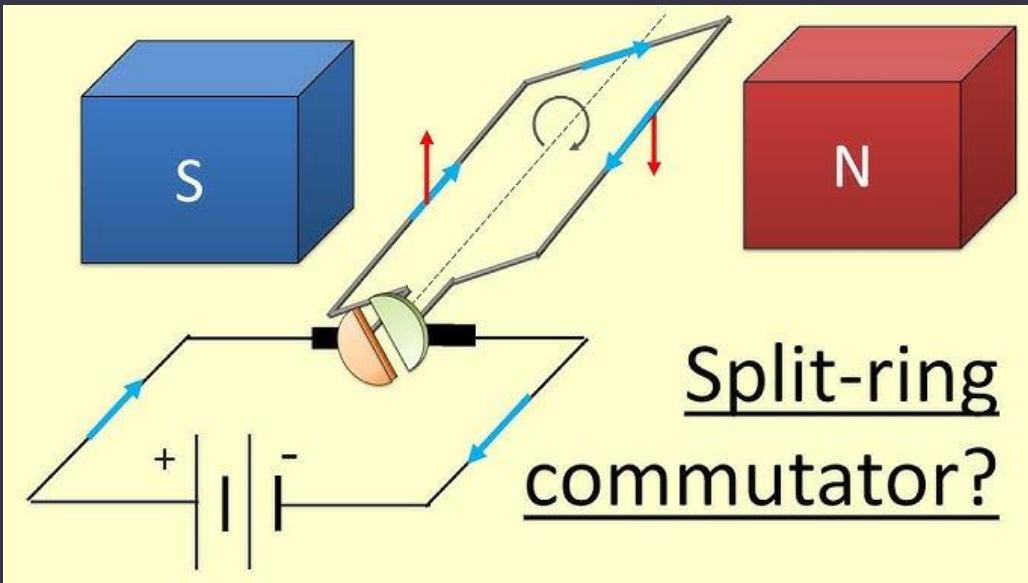
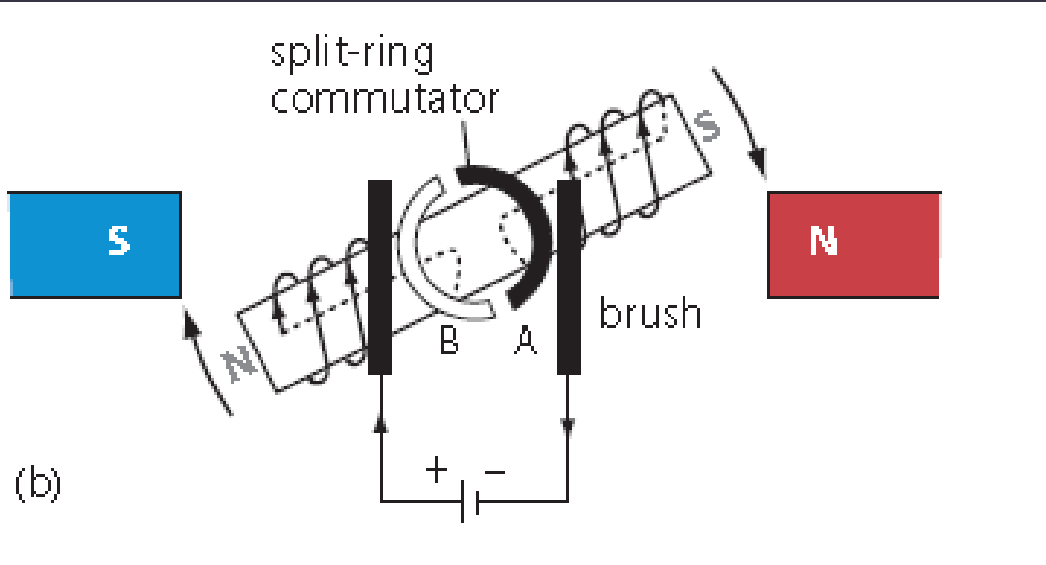


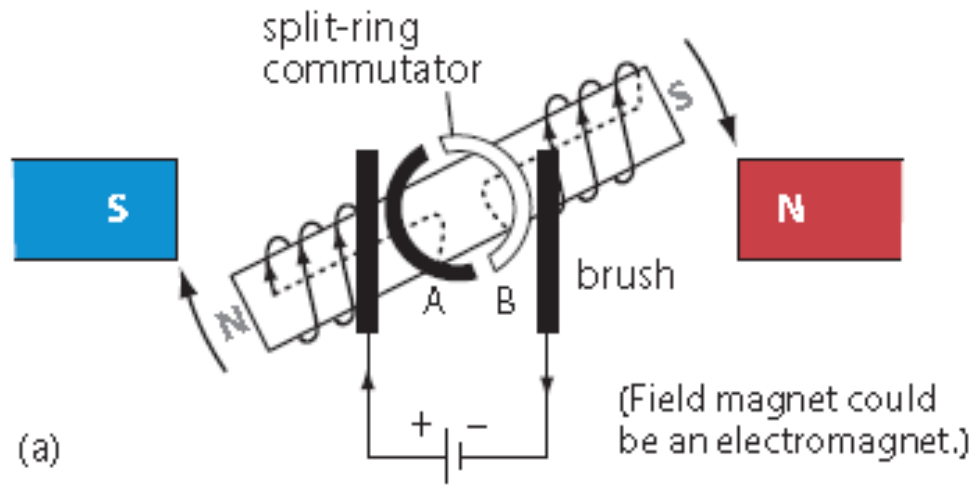
lines of force
due to current
in armature



Split-Ring Commutator

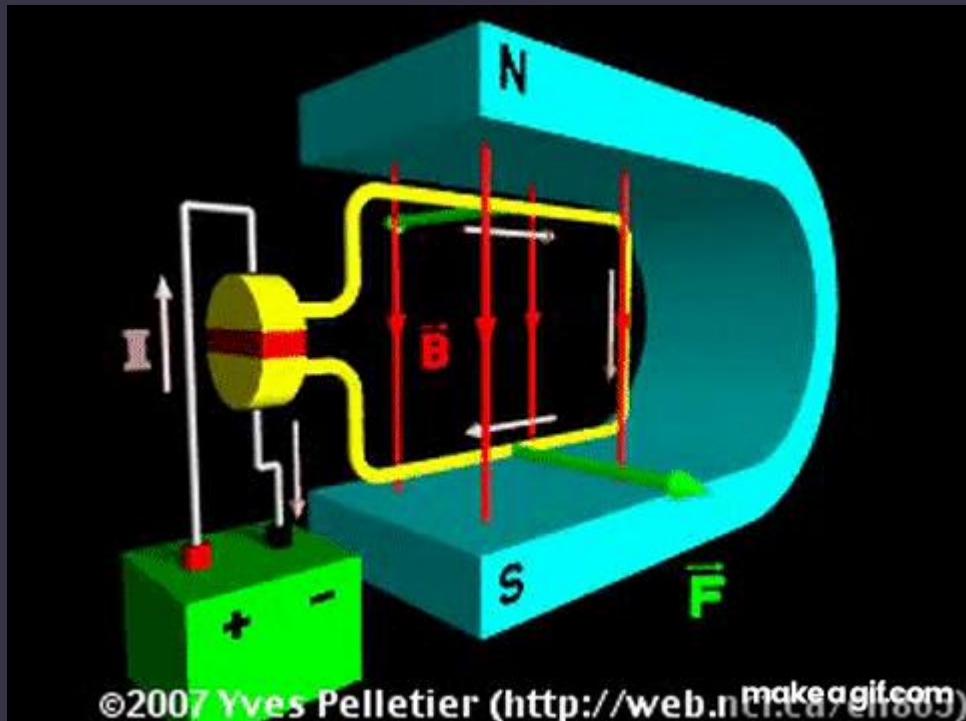
- Part of a **DC** motor
- Reverses current in **armature**
- Keeps rotation in **one direction**
- Without it:
 - Turns → stops → reverses
 - No continuous motion





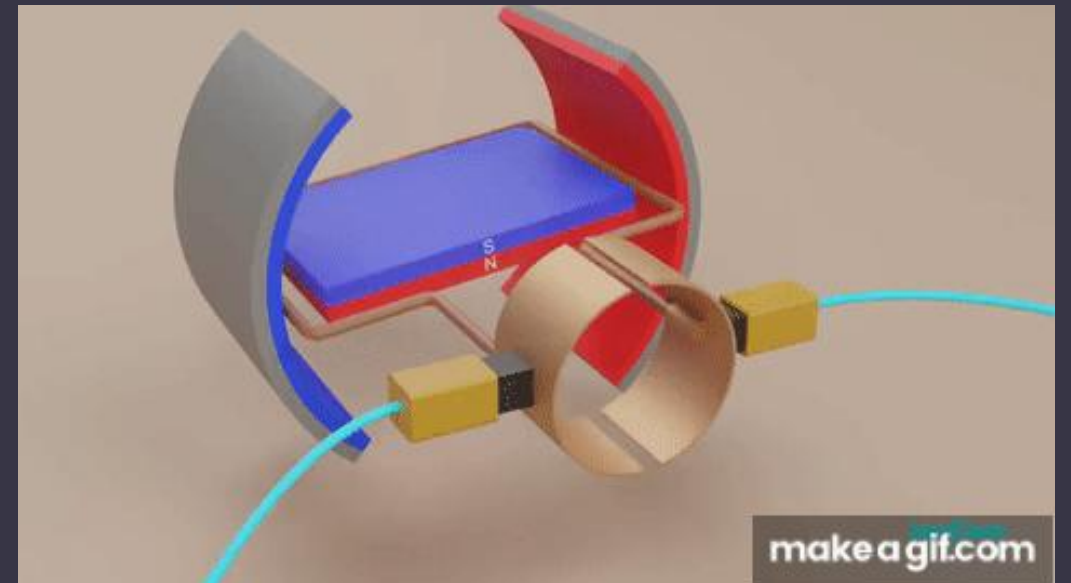
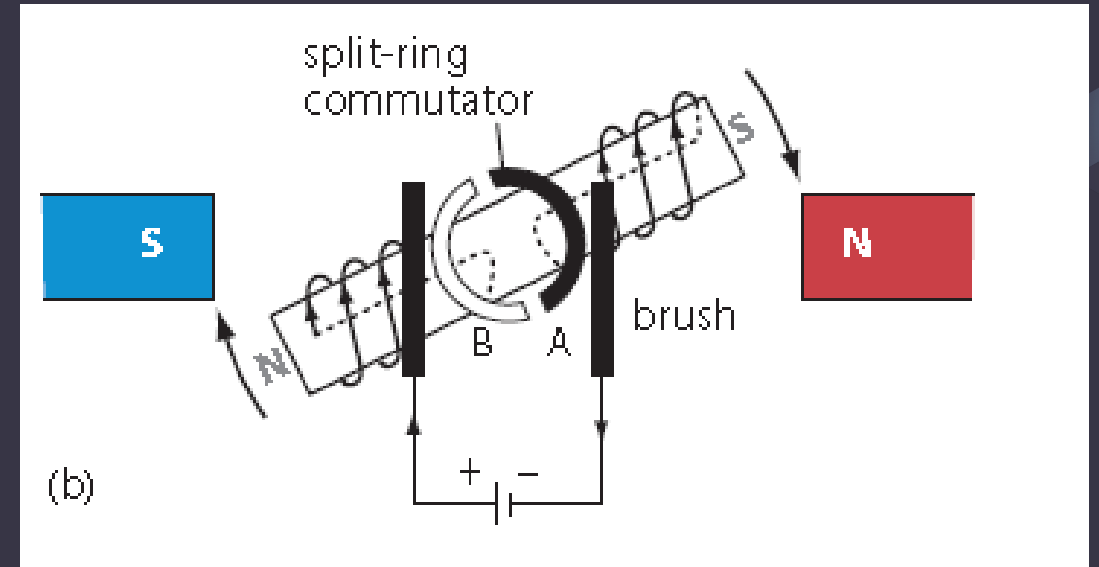
Turning the Motor

- Current flows:
 - **Brush A** → commutator → coil
- Coil becomes a **magnet**
 - Left side = **N** pole
 - Right side = **S** pole
- Attraction with **external** magnets
- Causes the coil to rotate

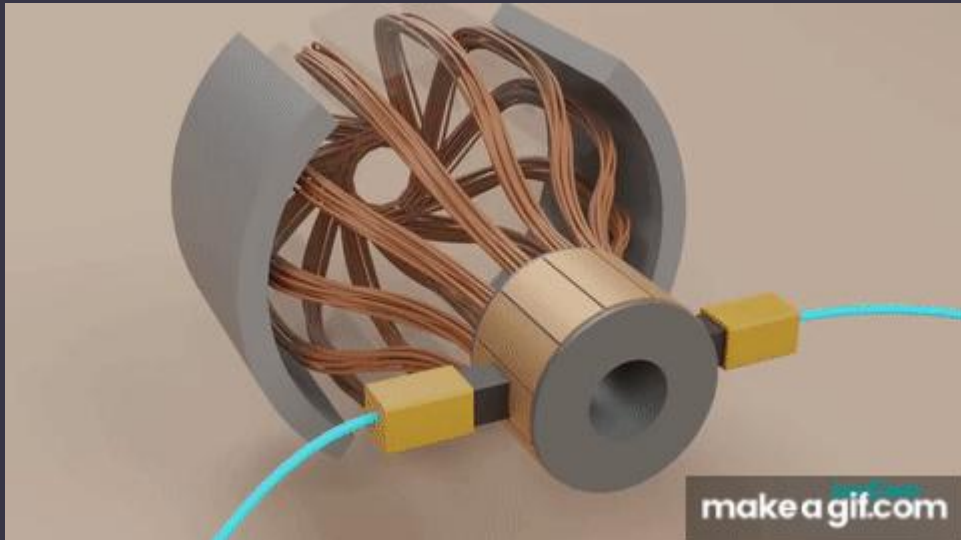
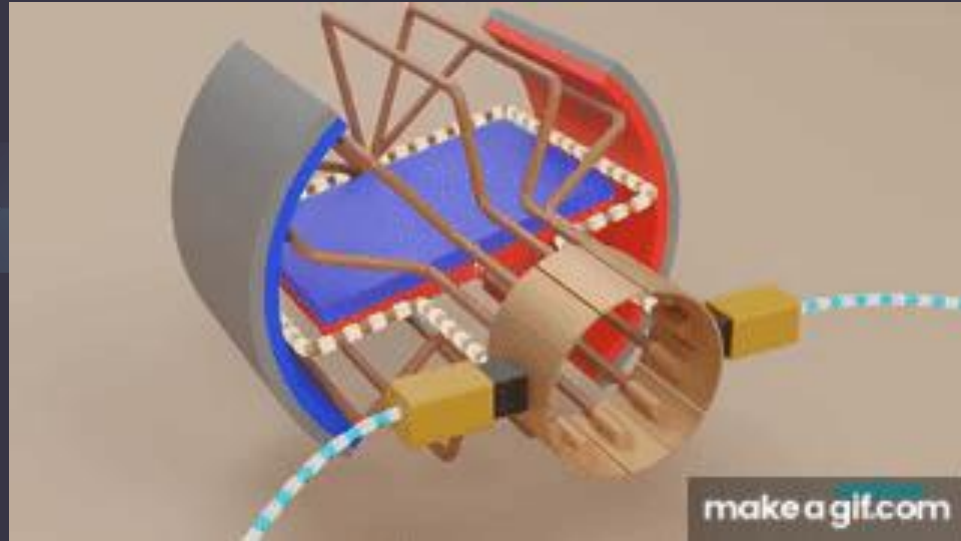


Turning the Motor Continued

- Current **reverses**:
 - Enters at B, leaves at A
- Armature poles switch sides
- Interaction with **field** causes continued rotation
- **Momentum** keeps coil turning
- Cycle repeats while current flows



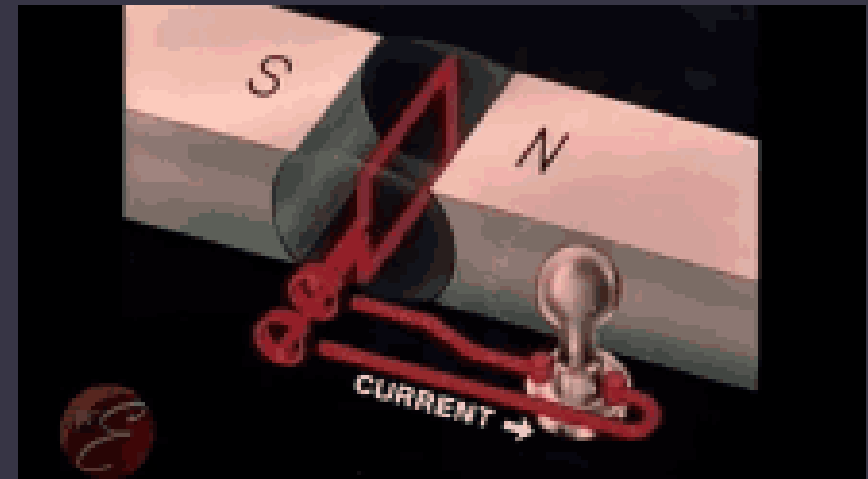
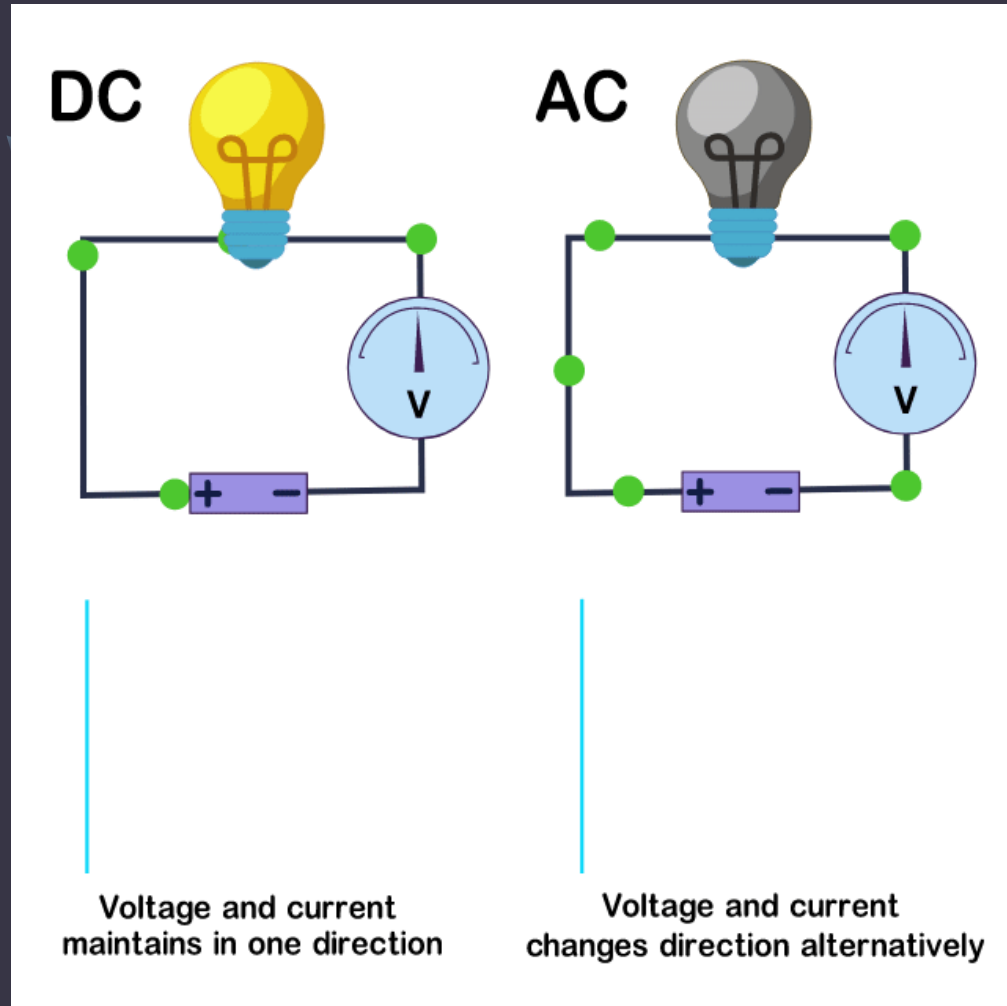
Smoother Motor Rotation



- More **armature** coils
- More **commutator** segments (gaps)
- Current switches more frequently
- Reduces “dead spots”
- Results in **smooth**, continuous rotation

AC Motors (Comparison)

- Uses **alternating** current (AC)
- Current reverses naturally
- No split-ring **commutator** needed
- Still produces rotating motion



Assignment:

*BC Physics 12 –
Sandner-Gore:*

- *Page 243 – Review*
7.3 #1-19

