

# Ch 20. Magnetism

# I. Magnet

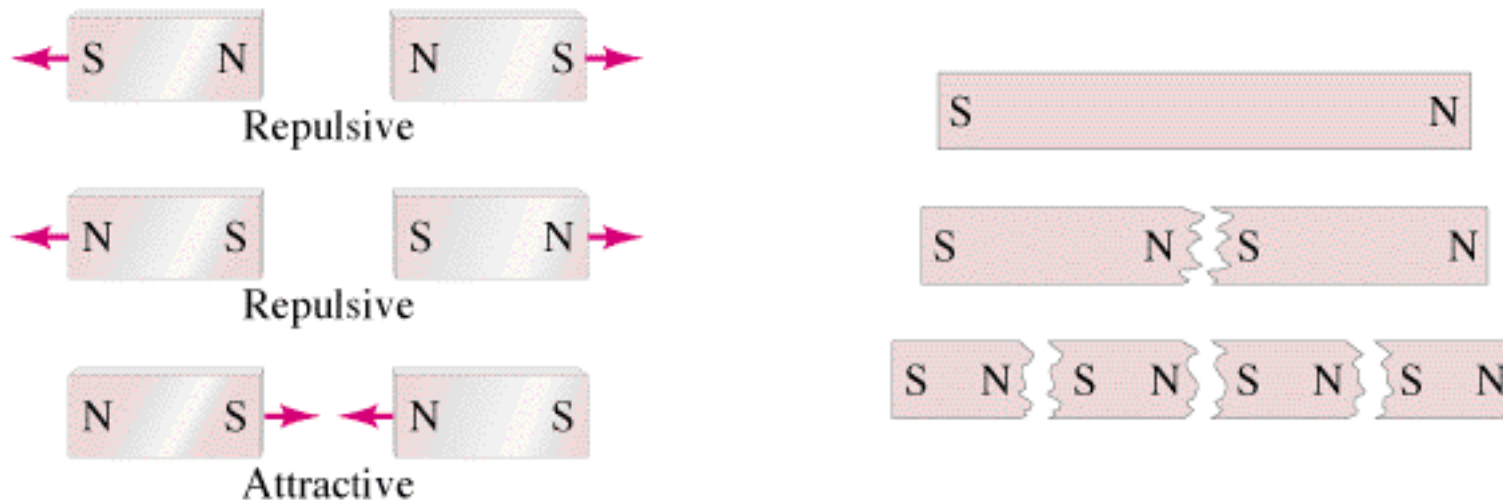
Poles of a magnet: magnetic effect is strongest

When the magnet is freely suspended

North pole: pointing to north

South pole: pointing to south

Poles always come in pairs



# Magnetic Materials

Magnetite  $\text{Fe}_3\text{O}_4$ : power to attract iron

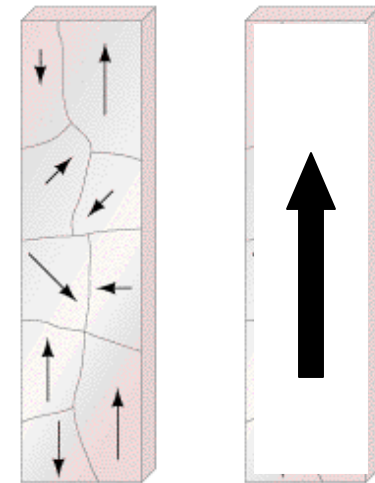
Elemental magnets: Fe, Co, Ni

Alloy & compounds:

Permanent magnet: NdFeB, SmCo

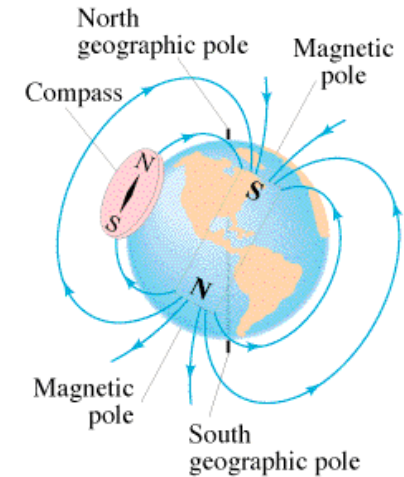
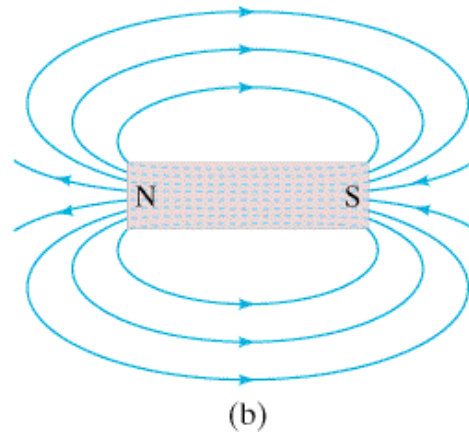
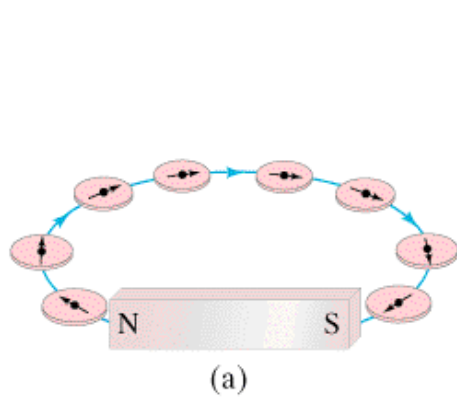
Recording tape:  $\text{CrO}_2$

Hard disk drive: CoCrPtB



unmagnetized      magnetized

# Magnetic Fields



## Magnetic Field **B**

Field lines, similar to electric field lines:

Field direction (North pole direction) tangent to a line at any point  
# of lines/area  $\sim$  magnitude of field