


LEONARDO 17

Summary



Lecture 17 Summary:

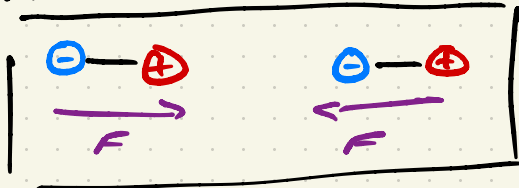
Dipoles, MAGNETS, & MAGNETIC FIELDS

- Serway 15.5, 19.1, 19.2

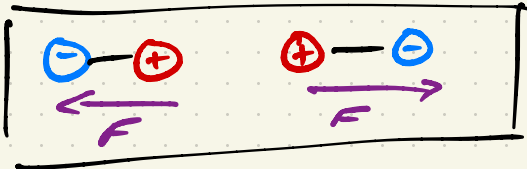
ELECTRIC DIPOLES:

- ATTRACT & REPEL ONE

ANOTHER: ATTRACT

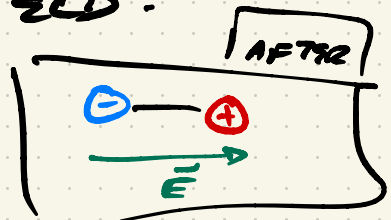
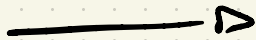
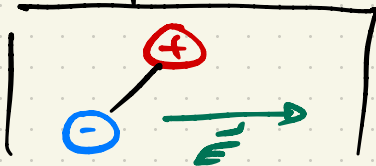


REPEL

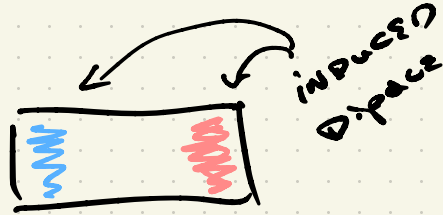


- ROTATE TO ALIGN W/

BEFORE AN ELECTRIC FIELD:

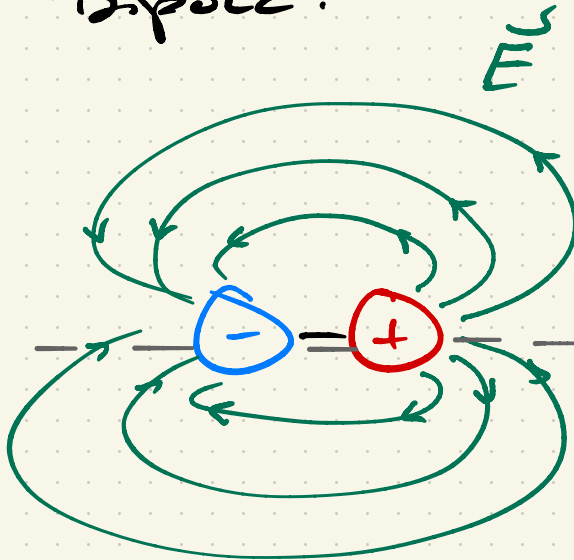


- ATTEMPTS POLARIZABLE MATERIALS BY INDUCING A DIPOLE:



E.G. CONDUCTOR OR DIELECTRIC

- ELECTRIC FIELD GENERATED BY DIPOLE:



SYMMETRY AXIS

MAGNETS

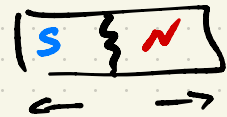
- OBJECTS WHICH BEHAVE IN MANY RESPECTS LIKE ELECTRIC DIPOLES.



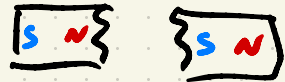
- ATTRACTION, REPELSION, INDUCTION

- DIFFER FROM ELECTRIC DIPOLES IN COUPLE MAJOR WAYS:

- ONLY ATTRACT SELECT MATERIALS - IRON, NICKEL, COBALT.
- CAN NOT SEPARATE THE TWO POLES!

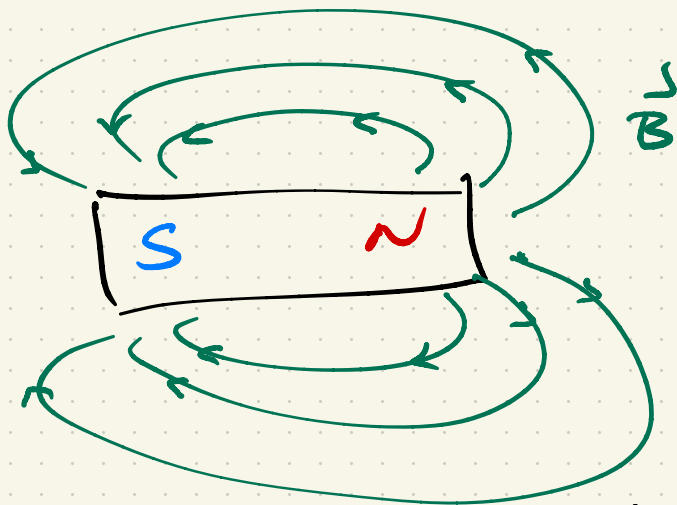


- NO ISOLATED MAGNETIC MONOPOLES". DIPOLE IS FUNDAMENTAL OBJECT OF MAGNETISM.

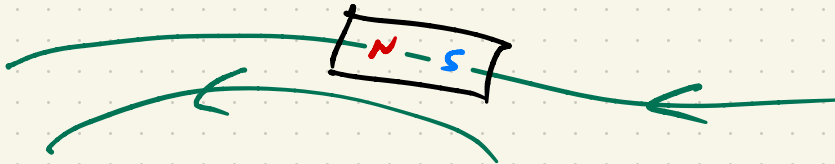


MAGNETIC FIELDS

- By analogy w/ electricity, we can envision magnets as generating a magnetic field (symbol \vec{B})



- Field lines all leave N pole, end @ S pole.
- Magnets rotate to align w/ \vec{B} field:



EARTH'S MAGNETIC FIELD

- MAGNETS TEND TO POINT W/ ONE POLE POINTING NORTH.
- BY CONVENTION WE CAN CALL THIS POLE THE "NORTH" (N) POLE, AND THE OTHER WE CAN "SOUTH" (S)
- EARTH HAS A MAGNETIC FIELD THAT IS ACCURATELY MODELLED AS A DIPOLE:

