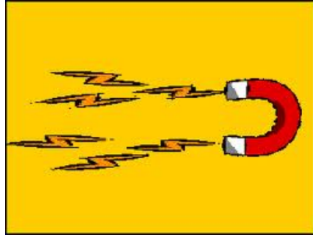
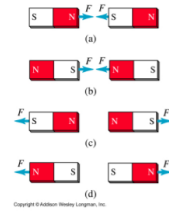


## Chapter 36 Magnetism



## Poles

1. Every magnet has two poles.
2. Opposite poles attract.
3. Like poles repel.

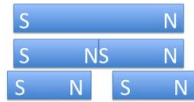


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## Poles

You cannot isolate a single pole. Cut a magnet and you have two magnets.



Some substances can be made into permanent magnets.

Some substances become temporary magnets when placed in a magnetic field. (That is why a magnet can attract a nail which is not magnetized.)

Some substances are not magnetic. (Example: wood)

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## Magnetic Field

Another kind of field

- gravitational field acts on any mass
- electrical field acts on any charge
- magnetic field acts on a magnetic pole or moving charge.

## Magnetic Domains

A spinning electron is a tiny magnet. A pair of electrons spinning in OPPOSITE directions cancel each other out. Electrons spinning in the SAME direction add up.

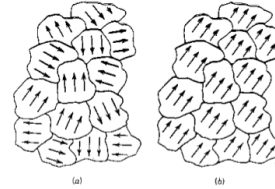


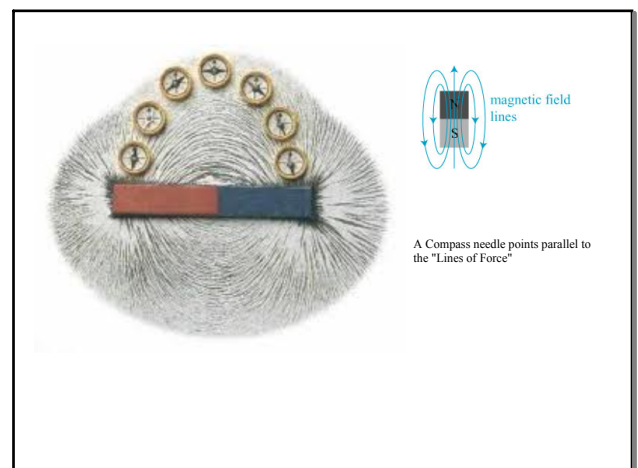
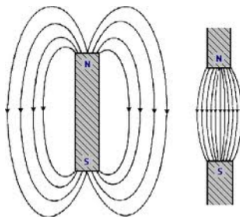
FIG. 8-27. Magnetic domains in a ferromagnetic solid. (a) Random domains when unmagnetized. (b) Parallel alignment of domains as a result of an external magnetic field.

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## What a field "looks like"

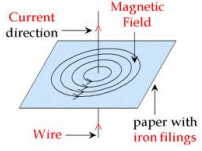
Lines always point away from the North and toward the South



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An electrical current sets up a magnetic field.



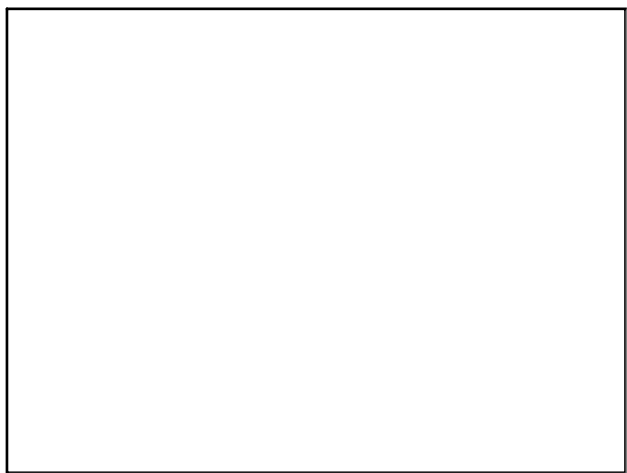
This is a "relativistic effect" if you were moving along with the current carriers you would not observe any magnetic field.

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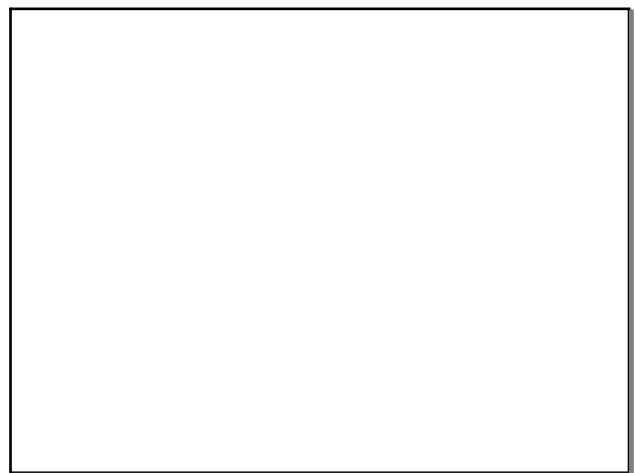
A magnetic field exerts a force on a moving charge.  
This is the principle behind all electrical meters and motors.



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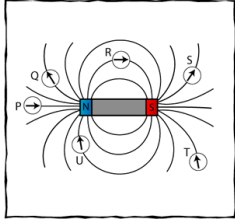


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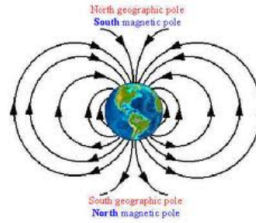


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Which of the magnets is/are reversed?



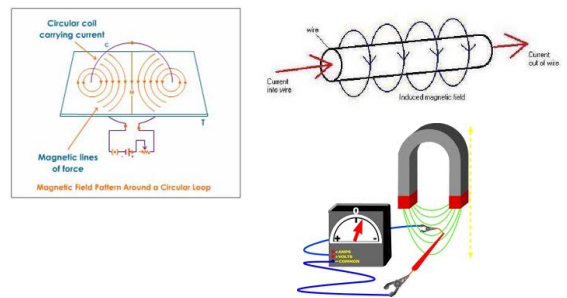
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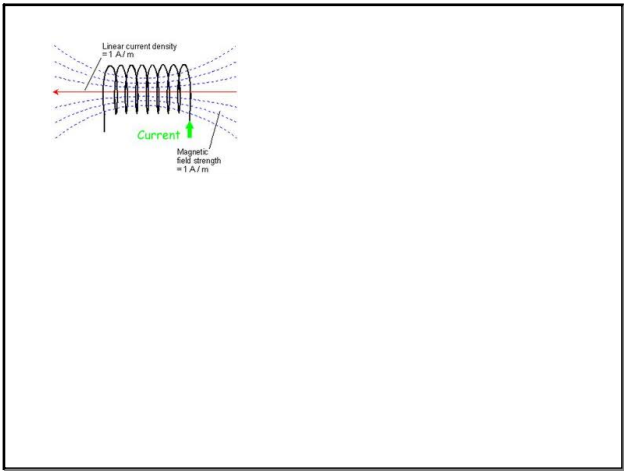
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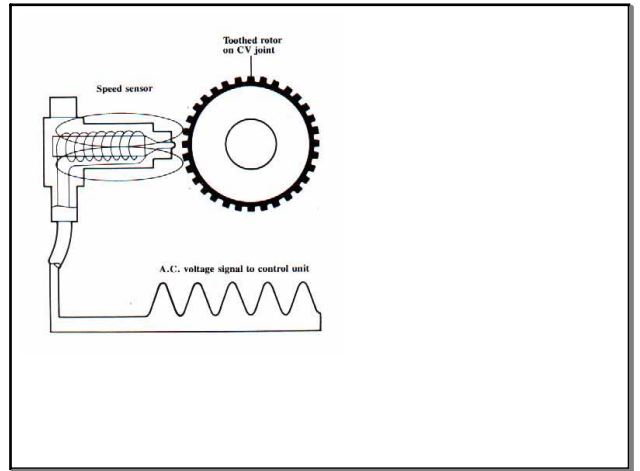
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Apr 28-1:03 PM



Apr 28-1:06 PM



Apr 28-1:11 PM