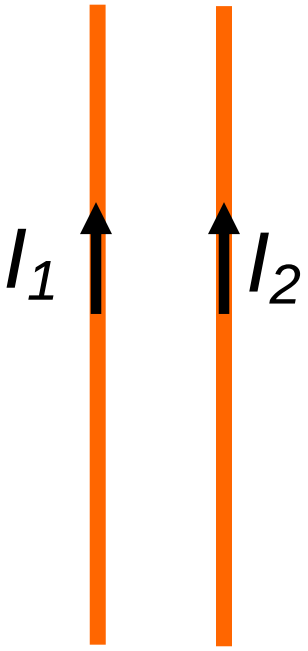
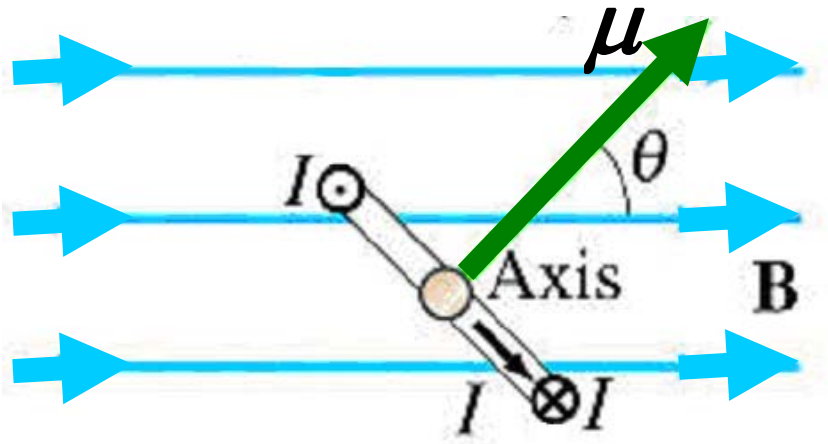
Parallel Wires



Consider two parallel current carrying wires. With the currents running in the same direction, the wires are

1. attracted (likes attract?)
2. repelled (likes repel?)
3. pushed in another direction
4. not pushed – no net force

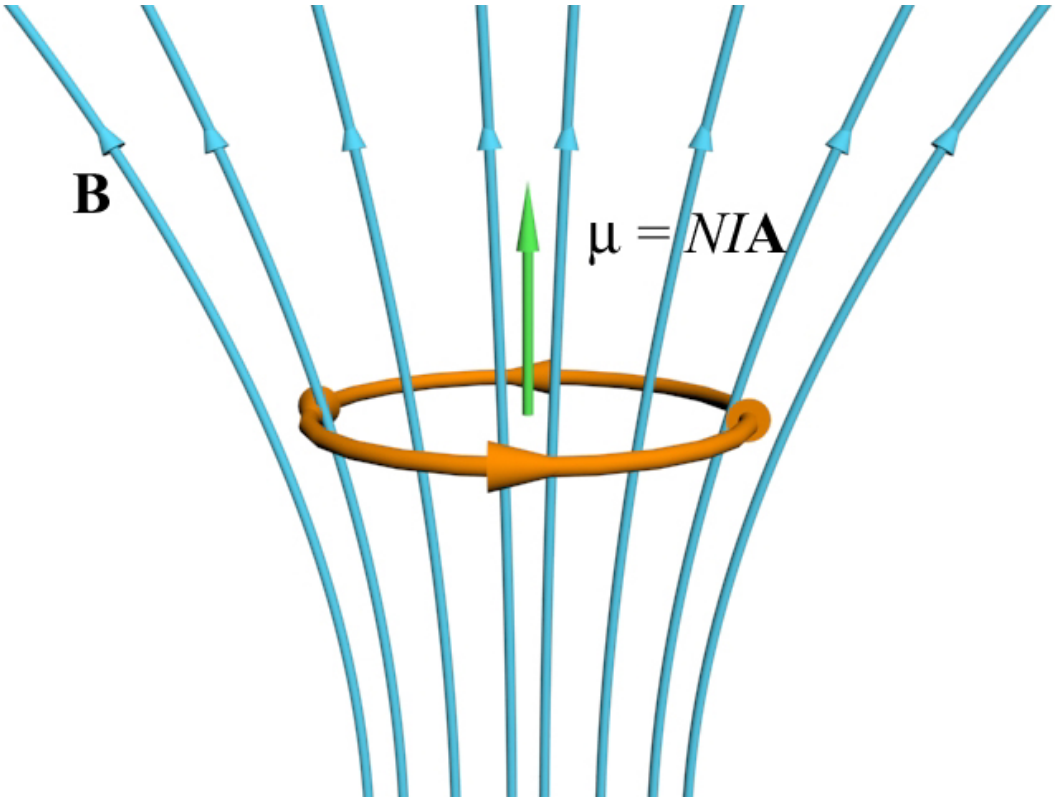
Dipole in Field



The coil above will:

1. rotate clockwise, not move
2. rotate countercw, not move
3. move to the right, no rotation
4. move to the left, no rotation
5. move in another direction, without rotation
6. move and rotate
7. no net force so no rotation or motion

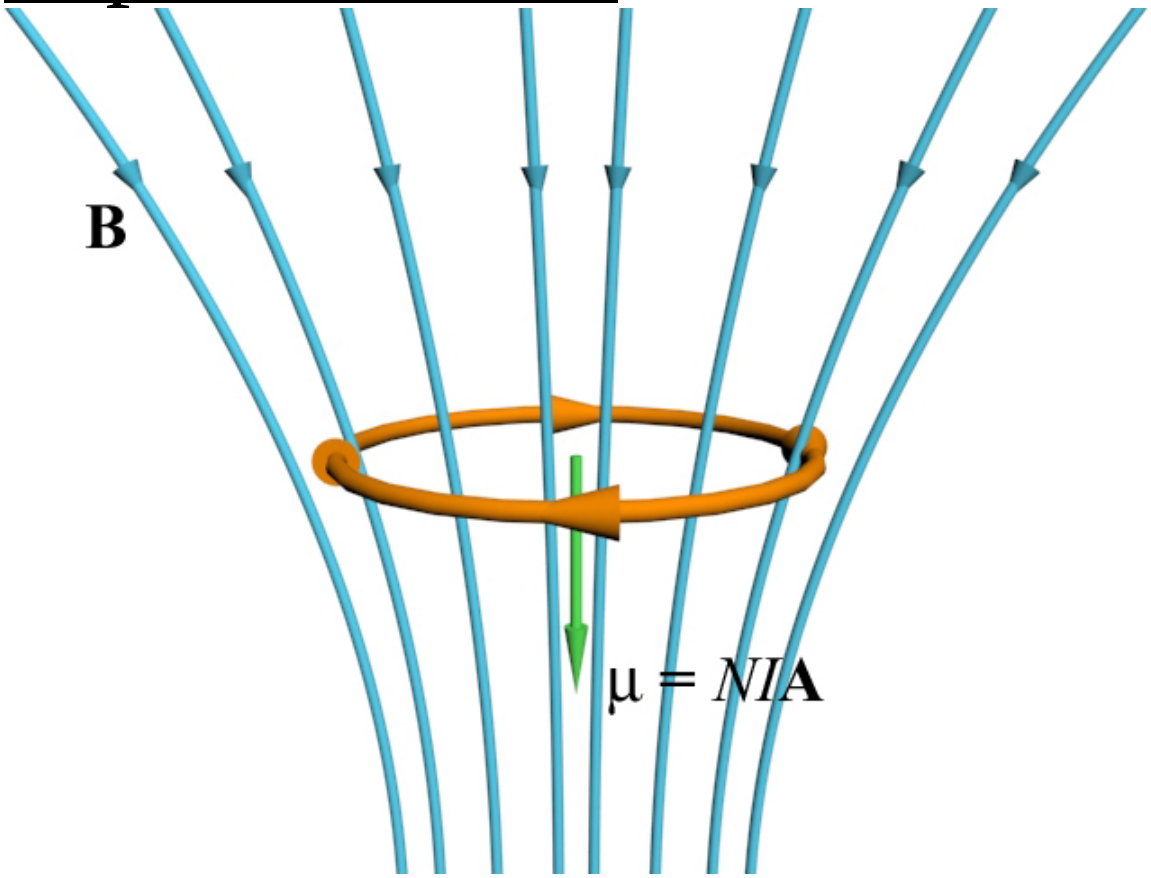
Dipole in Field



The current carrying coil above will move

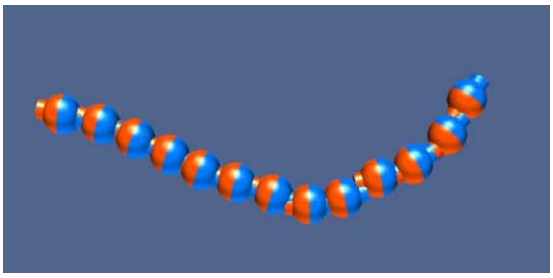
1. upwards
2. downwards
3. stay where it is because the total force is zero

Dipole in Field



The current-carrying coil above will move

1. upwards
2. downwards
3. stay where it is because the total force is zero



Free dipoles attract because:

1. The force between dipoles is always attractive independent of orientation.
2. A dipole will always move towards stronger field, independent of orientation.
3. The torque on the dipole aligns it with the local field and the dipole will then move toward stronger field strength.