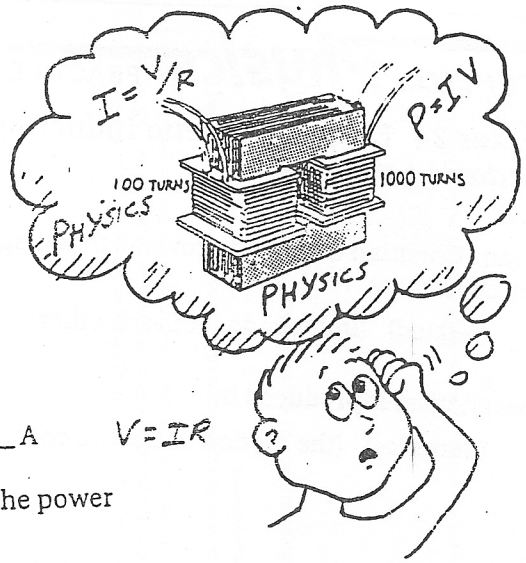
Transformers

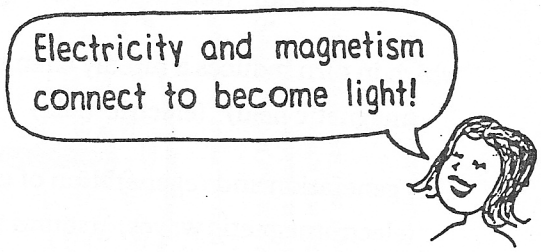


Consider a simple transformer that has a 100-turn primary coil and a 1000-turn secondary coil. The primary is connected to a 120-V AC source and the secondary is connected to an electrical device with a resistance of 1000 ohms.

1. What will be the voltage output of the secondary?
   _____ V
2. What current flows in the secondary circuit? _____ A
3. Now that you know the voltage and the current, what is the power in the secondary coil? _____ W
4. Neglecting small heating losses, and knowing that energy is conserved, what is the power in the primary coil? _____ W
5. Now that you know the power and the voltage across the primary coil, what is the current drawn by the primary coil? _____ A

Circle the correct answers:

6. The results show voltage is stepped (up) (down) from primary to secondary, and that current is correspondingly stepped (up) (down).
7. For a step-up transformer, there are (more) (fewer) turns in the secondary coil than the primary: For such a transformer, there is (more) (less) current in the secondary than in the primary.
8. A transformer can step up (voltage) (energy and power), but in no way can it step up (voltage) (energy and power).
9. If 120 V is used to power a toy electric train that operates on 6 V, then a (step up) (step down) transformer should be used that has a primary to secondary turns ratio of (1/20) (20/1).
10. A transformer operates on (dc) (ac) because the magnetic field within the iron core must (continually change) (remain steady).



WS3

Hewitt Drew It!