Electricity & Magnetism (Post-Test)

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Results		Class	STEM 3
Date	[Date]	Period	1

Answer the following questions to the best of your ability. Each multiple-choice question has one and only one correct answer. There is overlap here with concepts we explored last year and you should be able to leverage some of that knowledge here.

1. What relationship exists between the intensity of electrical current and the amount of resistance of a circuit?
   a. Direct, assuming voltage varies freely
   b. Inverse, assuming voltage is constant
   c. Direct, assuming voltage is constant
   d. Inverse, assuming voltage varies freely
2. Electric motors and generators almost always include loops of wire. Why?
   a. Allows easy conversion of alternating current to direct current
   b. Maximizes the number of electrons in the magnetic field at once
   c. It's one of those things we don't yet understand but we know it works
   d. Provides structural strength for the power supply
3. Magnetic fields have positive and negative poles. If you place the negative poles of two magnets close together, what do you expect to happen?
   a. They should conduct electricity between them
   b. They should spin like a motor
   c. They should push themselves apart
   d. They should pull themselves together

4. Traditional batteries like the one in your phone rely on what to deliver power?

    a. Chemical reactions

    b. Mechanical processes

    c. Kinetic operations

    d. Electrostatic discharge

5. Which of the following is a true statement?

    a. Generators convert mechanical energy into electrical energy

    b. Generators convert chemical energy into electrical energy

    c. Motors convert mechanical energy into electrical energy

    d. Motors convert chemical energy into electrical energy

6. In general terms, mechanical advantage can be calculated by

    a. Multiplying the force input by the force output

    b. Multiplying the force output by the force input

    c. Dividing the force output by the force input

    d. Dividing the force input by the force output

7. Some electric motors have axles that are harder to turn than others, by design. What makes those axles harder to turn?

    a. They rotate at higher speed

    b. They have lower torque

    c. There is not enough oil or grease in the motor

    d. They are pushing more current

8. Which of the following is not an essential component of an electric motor?

    a. Gear

    b. Magnet

    c. Terminal wire ends

    d. Coiled wire

9. On a separate half-sheet of paper (provided), write your name and diagram a generator. Label the magnet, coils, a source of mechanical energy, and add arrows to indicate the flow of current as well as the movement of any mechanical components. Below your diagram, indicate what type of mechanical power source you selected.