8th Grade Science
Redlands Middle School

Name _____
Date_____ Period ____ Score_____/4

Magnetism & Electricity
Skill Builder

Answer questions 1 – 10 based on your observations

Characteristics of Magnets

1. Specifically, what are magnets attracted to?

Materials that can be magnetized, which are also the ones that are strongly attracted to a magnet, are called ferromagnetic These include iron, nickel, cobalt, some alloys of rare-earth metals, and some naturally occurring minerals such as lodestone

2. How far does the magnetic field extend beyond the ends of the magnets you experimented with? How did you measure the distance?

Approximately 2 – 6 cm

3. What relationship did you find between the magnetic field and non-magnetic material? For example: did non-magnetic materials allow the field to pass through or did they block the field? Explain.

When we observed how the iron filings aligned with the magnetic field the field went through the folder paper. Some groups observed attracting two magnets through their desk top. Both demonstrate a situation where the field is not blocked.

4. How do two magnets interact with each other? For example, what happens when "NORTH" meets "NORTH" or "SOUTH meets "NORTH"?

Like poles (N –N or S – S) repel and opposite poles (N – S) attract.

Generating Electricity

5. What happens to the voltmeter needle when you spin the coil of wires by the magnet? It moved slightly

6. What does this show? This shows an electric current has been generated

7. Specifically, what caused the needle to move (what created the current of electrons)?

The magnetic field of the magnet pushes free electrons that are in the coil of wire, causing a current

8. Does a current flow when the coil was not moving? NO

9. What two forms of energy are present in the generator that we used?

Mechanical/kinetic electricity

10. Where does the energy come from to move the coil? Chemical potential energy released in muscles

Answer questions 11 – 13 using the text: Magnetism (pages 224-229)

11. Define magnetic field – surrounds a magnet and exerts a force on magnets and objects made of magnetic materials

12. Define magnetic poles – region on a magnet where the magnetic force is the strongest

13. Describe magnetic domains – a domain is a group atoms whose magnetic poles are aligned

Answer 14 – 17 using the text: Producing Electric Current (pages 238 – 241)

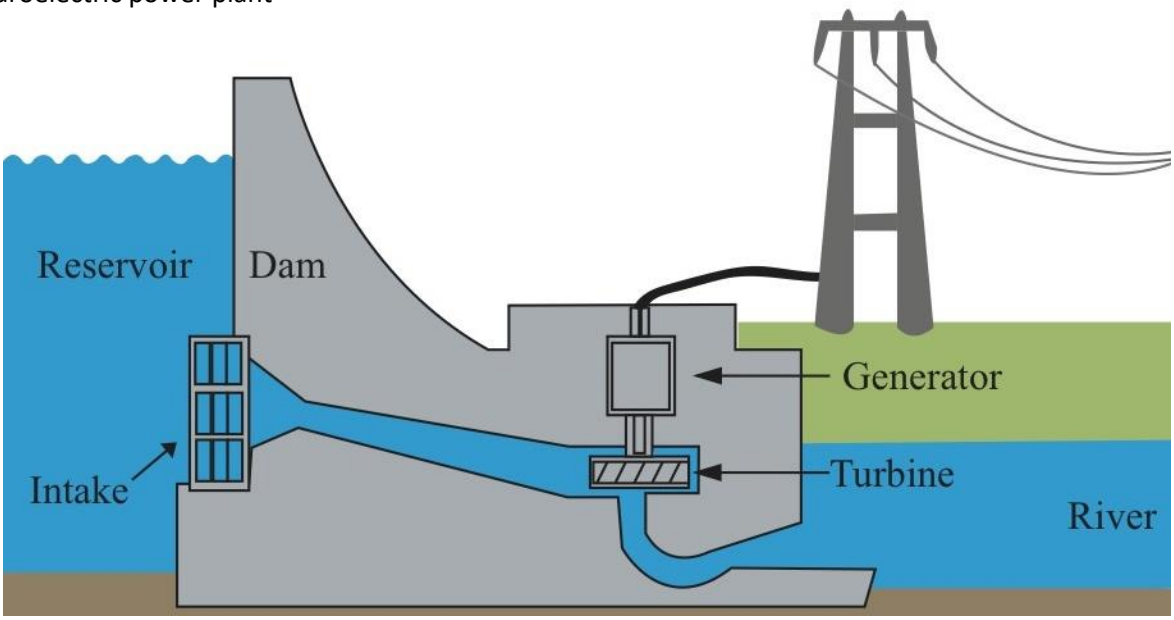
14. Summarize the findings of Michael Faraday and Joseph Henry.

They found if you run a magnet through a loop of wire an electric current is generated and moving the loop through the magnetic field also created a current – the system must move for this to work

15. Define electromagnetic induction – is the generation of a current by CHANGING a magnetic field

16. Describe how a generator works – mechanical forces causes electromagnetic induction between a magnet and wire coil, creating a current

17. Hydroelectric power plant



Explain the energy transformations occurring in this system

Gravitational potential energy of the water is transformed into kinetic energy when water is released into the pipe at the intake. Kinetic energy spins the turbine which is connected to the generated where electromagnetic Induction occurs, transforming kinetic energy into electricity

What would we find if we opened the generator? Coils of wire and magnets

Challenge (Optional). Explain how this system could be considered to be solar powered.

Hydroelectric dams take advantage of the water cycle which is driven by the Sun. The Sun heats the water which is evaporated and rises into the atmosphere where it cools and condenses. The clouds eventually release precipitation in the form of rain or snow. Runoff is captured by the dam and stored as gravitational potential energy.