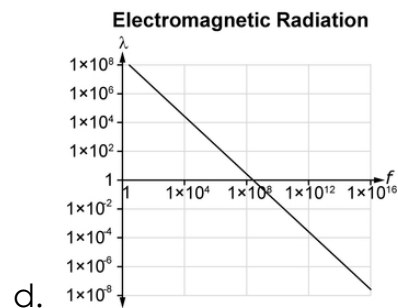
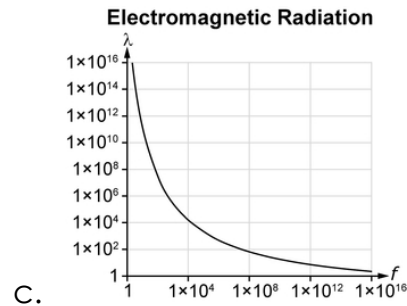
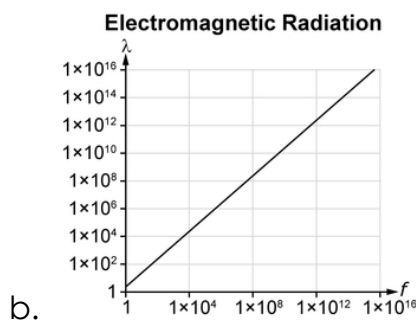
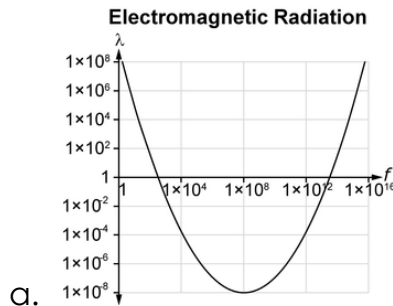


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Physical Science Unit 3 Practice Sheet

*Chapter 18:

- When the speed of a wave doubles as it passes from shallow water into deeper water, what happens to its wavelength?
 - It is halved.
 - It is unchanged.
 - It is doubled.
 - It is quadrupled.
- Which of the following terms represents the number of waves passing a given point each second?
 - frequency
 - amplitude
 - velocity
 - wavelength
- Which graph correctly displays the relationship between wavelength, in meters, and frequency, in hertz, in the electromagnetic spectrum?



- Light travels fastest through which of the following?
 - air
 - glass
 - vacuum
 - water
- What do radio waves, microwaves, X-rays, and gamma rays all have in common?
 - Their electric fields and magnetic fields are tangent to each other.
 - Their electric fields and magnetic fields are independent of each other.
 - Their electric fields and magnetic fields are parallel to each other.
 - Their electric fields and magnetic fields are perpendicular to each other.

6. In which of the following wave types is the particle motion perpendicular to wave motion?
- a. longitudinal wave
 - b. p wave
 - c. surface wave
 - d. transverse wave
7. If a wave is traveling at a certain speed and the frequency is increased, what will happen to its wavelength?
- a. The wavelength will increase.
 - b. The wavelength will produce a standing wave.
 - c. The wavelength will remain the same.
 - d. The wavelength will decrease.
8. The speed of sound through water is 1400 m/s. Which of the following could be the speed of a sound wave through air?
- a. 340 m/s
 - b. 1400 m/s
 - c. 3500 m/s
 - d. 5900 m/s
9. Why can sound NOT travel through a vacuum?
- a. The vacuum does not have any particles that are required to transport the sound waves.
 - b. The vacuum has too many particles that are packed too closely to transport sound waves.
 - c. The vacuum does not have enough particles to transport sound waves.
 - d. The vacuum has the incorrect type of particles to transport sound waves.
10. Which of the following BEST explains how longitudinal and transverse waves transfer energy?
- a. In both longitudinal and transverse waves the energy is transferred horizontally.
 - b. In both longitudinal and transverse waves the energy is transferred in an up and down direction.
 - c. In longitudinal waves the energy is transferred in an up and down direction, and in transverse waves the energy is transferred horizontally.
 - d. In longitudinal waves the energy is transferred horizontally, and in transverse waves the energy is transferred in an up and down direction.
11. Which of the following is true if a sound wave travels from a solid to a gaseous medium?
- a. The wavelength will increase as it moves from a solid to a gas.
 - b. The wavelength will decrease as it moves from a solid to a gas.
 - c. The wavelength will stay the same as it moves from a solid to a gas.
 - d. The wavelength will disappear as it moves from a solid to a gas.

12. Which type of wave can travel through a vacuum?

- a. sound waves
- b. mechanical waves
- c. water waves
- d. electromagnetic waves

13. Which is NOT correct about waves?

- a. Waves travel through a medium.
- b. Wave energy comes from vibrations.
- c. Waves transfer matter and not energy.
- d. Waves transfer energy and not matter.

14. The wavelengths of red, green, and blue light are shown in the table.

Color	Wavelength (nm)
red	620–780
green	490–570
blue	440–490

Which statement correctly compares the frequency and energy of two different colors of light?

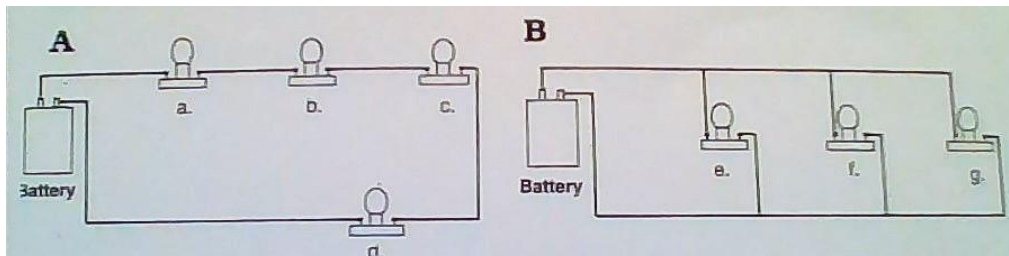
- a. Red light has a lower frequency and more energy than green light.
- b. Red light has a greater frequency and less energy than green light.
- c. Green light has a lower frequency and less energy than blue light.
- d. Green light has a greater frequency and more energy than blue light.

15. What is one difference between an electromagnetic wave and a mechanical wave?

- a. A mechanical wave can travel through a vacuum. An electromagnetic wave must have a medium to travel through.
- b. An electromagnetic wave can travel through a vacuum. A mechanical wave must have a medium to travel through.
- c. An electromagnetic wave moves parallel to the direction of the wave's travel. A mechanical wave can move only perpendicular to the direction of the wave's travel.
- d. An electromagnetic wave moves perpendicular to the direction of the wave's travel. A mechanical wave can move only parallel to the direction of the wave's travel.

***Chapter 20:**

Use the following diagrams to answer questions 16 – 20.



16. Label circuits A and B as series or parallel.

17. If bulb a burns out, will bulb d still light?

18. If bulb f burns out, will bulb g still light?

19. If bulbs b, c, and d are burned out, will bulb a still light?

20. If bulbs f and g are missing, will bulb e still light?

21. Would series or parallel circuits be better for wiring lights in a house? Why?

22. What voltage produces a current of 50 amps with a resistance of 20 ohms?

23. Find the current when a 12-volt battery is connected through a resistance of 25 ohms.

24. What resistance would produce a current of 200 amperes with a potential difference of 2,000 volts?

25. What is an automatic switch that opens when the current reaches a set value?

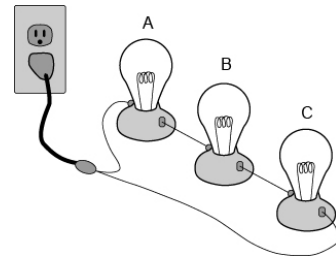
a. surge suppressor

c. relay

b. circuit breaker

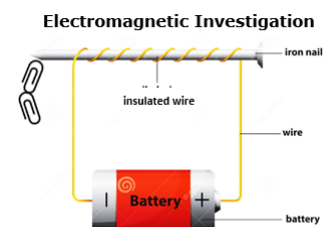
d. fuse

26. A car panel lamp has a resistance of 33 ohms when it is placed across a 12-V battery. What is the current through the circuit?
- a. 0.36 A b. 2.8 A c. 3.96 A d. 396 A
27. What is the number of paths through which electricity can flow in a series circuit?
- a. 1 b. 2 c. 3 d. 4
28. What happens to the current flowing through a circuit as resistance increases?
- a. It increases. c. It stays the same.
b. It decreases. d. It reverses direction.
29. All of the houses on Victoria's street lose power, but the houses on the next street still have power. What is the MOST probable reason why this occurred?
- a. Most of the houses on Victoria's street are in a series circuit, and one is in a parallel circuit.
b. Most of the houses on Victoria's street are in a parallel circuit, and one is in a series circuit.
c. All of the houses on Victoria's street are in a parallel circuit.
d. All of the houses on Victoria's street are in a series circuit.
30. What would happen if bulb B was removed?
- a. Bulb A and C would not light up.
b. Bulb A and C would both light up.
c. Bulb A would not light, but bulb C would light.
d. Bulb A would light, but bulb C would not light.



*Chapter 21:

31. What will increase the strength of the electromagnet?
- a. Removing the iron nail from the coil of wire.
b. Decreasing the number of turns in the wire coil.
c. Increasing the diameter of the turns in the coiled wire.
d. Increasing the electric current flowing through the coiled wire.
32. Henry investigates how the flow of electricity produces magnetism. He follows this procedure. Since only two paper clips adhered to the nail, which action would **BEST** make the electromagnet attract more paper clips?
- a. Replace the nail with a pencil.
b. Increase the number of coils of insulated wire.
c. Connect an on/off switch between the battery and the

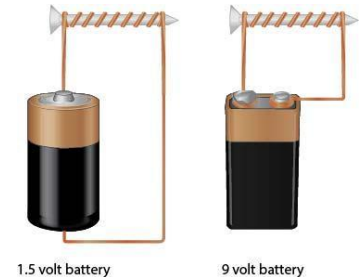


nail.

- d. Reverse the direction of the positive and negative poles of the battery.

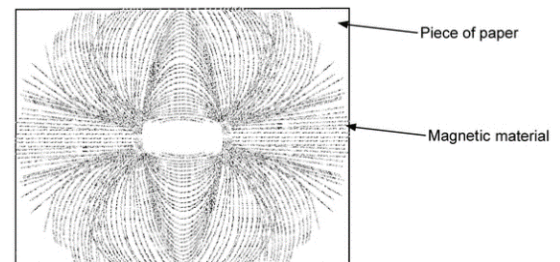
33. James makes two electromagnets, as shown in the figure below. Which of the following statements about the magnetic field created by the two electromagnets is correct?

- a. The 9 volt battery will create a magnetic field that is 6 times as strong as the 1.5 volt battery.
- b. The 1.5 volt battery will produce a magnetic field that is 6 times as strong as the 9 volt battery.
- c. The 1.5 volt battery will produce a magnetic field that is 36 times as strong as the 9 volt battery.
- d. The two batteries will produce the same magnetic field strength.



34. The diagram shows the result when a student placed a magnet under a piece of paper, then sprinkled iron shavings on the paper. The magnetic material is distributed this way because magnets

- a. have magnetic fields that repel magnetic materials and push the shavings away.
- b. have multiple magnetic fields that attract the shavings with different strengths.
- c. have uneven magnetic fields that attract the shavings in random patterns.
- d. have magnetic fields that flow from one pole of the magnet to the other.



35. Which modification to a solenoid would be MOST LIKELY to decrease the strength of its magnetic field?

- a. removing its iron rod core and increasing the number of coils
- b. increasing the current and reducing the number of coils
- c. reducing the number of coils and inserting an iron core
- d. decreasing the current and reducing the number of coils

36. How can a current be induced in a closed circuit without the use of a battery or electrical power?

- a. by moving the circuit into a high temperature field
- b. by moving the circuit into a gravitational field
- c. by moving the circuit into a magnetic field
- d. by moving the circuit into a nuclear field

37. Which of the following is NOT a way to make a magnet lose its magnetism?

- a. heating the magnet

- b. dropping the magnet repeatedly
- c. hitting the magnet with a hammer
- d. All of them can cause a magnet to lose its magnetism.

38. A current in a long, straight wire produces a magnetic field. Which of the following BEST describes these magnetic field lines?

- a. The field lines radiate outward from the wire to infinity.
- b. The field lines come inward from infinity to the wire.
- c. The field lines form circles that pass through the wire.
- d. The field lines form circles that go around the wire.

39. Noel is trying to understand the relationship between electron flow and the polarity of an electromagnet. He wants to test the electromagnet he created, shown in the photograph.



First, Noel needs to know which direction electrons flow through the copper wire. Which statement about the flow of electrons is correct?

- a. Electrons flow from north to south because of Earth's magnetic field.
- b. Electrons flow from south to north because of Earth's magnetic field.
- c. Electrons flow from the positive terminal of a battery to the negative terminal of a battery.
- d. Electrons flow from the negative terminal of a battery to the positive terminal of a battery.

40. In which direction do magnetic field lines flow around a bar magnet?

- a. from the north pole to the south pole
- b. from the south pole to the north pole
- c. in all directions away from the magnet
- d. in circles around the magnet

41. Which of the following correctly states which sides of two magnets would attract?

- a. the north poles of both magnets
- b. the south poles of both magnets
- c. the north pole of one magnet and the south pole of the other magnet
- d. magnets cannot attract each other, they can only attract certain metals

42. What happens when you cut a magnet in half?

- a. One half has a north pole only and one half has a south pole only.

- b. Both halves now have a north pole and a south pole.
- c. The magnet loses its magnetism
- d. Magnets cannot be cut in half.

43. What is the difference between a solenoid and an electromagnet?

- a. A solenoid cannot last as long as an electromagnet.
- b. An electromagnet cannot last as long as a solenoid.
- c. A solenoid has a ferromagnetic core and an electromagnet does not.
- d. An electromagnet has a ferromagnetic core and a solenoid does not.

44. Which subatomic particles of the atom are responsible for magnetism?

- | | |
|------------|--------------|
| a. nucleus | c. neutrons |
| b. protons | d. electrons |

45. What is Earth's magnetic field called?

- a. atmosphere
- b. thermosphere
- c. magnetosphere
- d. Earth does not have a magnetic field; it is not a magnet.