

Physical Science
Week 17: Text pp. 398-409

True (+) or False (0): Write all answers on the answer sheet.

1. Isoclinic lines mark locations that have the same magnetic deviation.
2. The illustration at the top of p399 shows that the isoclinic line for Maryland would be about 75 degrees N.
3. The solar wind is a stream of helium atoms.
4. The solar wind travels at a speed of about 10,000 MPH.
5. The magnetosphere is larger on the side of the earth facing away from the sun.
6. Some of the solar wind penetrates the magnetosphere but is trapped by the Van Allen radiation belts.
7. Each electron of an atom seems to have 2 types of motion.
8. Electron spin is the most important cause of magnetism in magnetic materials.
9. The more paired electrons a substance has, the more magnetic it will be.
10. Iron is the most magnetic substance in its natural state.
11. Nickel is a strongly magnetic material.
12. A group of aligned atoms having a single magnetic field is called a pole.
13. Copper has many unpaired atoms.
14. A magnetically "soft" substance is difficult to magnetize.
15. Pure iron is magnetically "soft".
16. Alnico is a magnetically "soft" material.
17. Heating a magnet may cause the magnet to lose its magnetism.
18. Whenever electricity flows through a wire, a magnetic field is produced around the wire.
19. Electromagnets are permanent magnets.
20. The strength of an electromagnet can be increased by increasing the number of loops of wire in the coil.

Fill in the answers on the answer sheet:

1. The magnetosphere is distorted by the _?_.
2. The magnetic field of a magnetic substance is produced by the motion of _?_.
3. Electrons have an orbital motion around the nucleus of an atom. They also have a _?_ motion.
4. Which motion of an electron produces the stronger magnetic field?
5. When electrons spin in opposite directions, their magnetic fields _?_.
6. Most substances normally have a net magnetic field of what strength?
7. Iron atoms have _?_ unpaired electrons.
8. Samarium is called a _?_ _?_ element.
9. Unmagnetized steel is not magnetic because _?_ are not aligned.
10. Using the information found on p403, why could a magnet lose its magnetism if you hammer it?

11. Substances with no unpaired electrons are called ? substances.
12. Substances that have several unpaired electrons per atom are said to be ?
13. Magnets made of magnetically “hard” materials are called ? magnets.
14. An ? is a device that produces a strong magnetic field when electricity passes through a wire wrapped around it.
15. The 2 main parts of a strong electromagnet are the ? and the ? .

Vocabulary - write the definitions for these terms on the answer sheet and be able to explain them next week from memory in your own words .

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| 1. domain | 5. permanent magnet |
| 2. domain theory | 6. electromagnet |
| 3. paramagnetic | 7. core (magnetic) |
| 4. ferromagnetic | 8. electromagnetic induction |