Name _____ date _____ period ____

Station Activity Magnetism

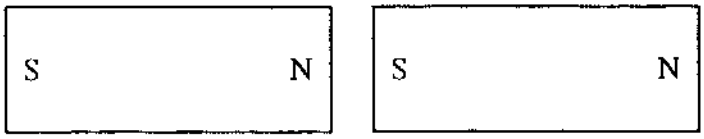
Station 1 – use the textbooks provided to answer the following questions

1. The region around a magnet that exerts magnetic force is called a(an) _____.

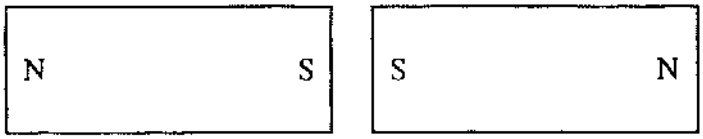
2. The region where a magnet's force is strongest is at the_____.

3. The magnetic field lines of a bar magnet begin near the magnet's _____.

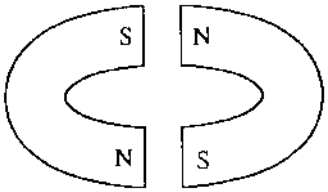
4.



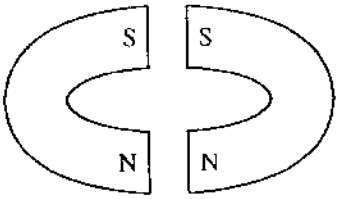
7. Will the magnets in the figure above attract or repel each other?



8. Will the magnets in the figure above attract or repel each other?



9. Will the magnets in the figure above attract or repel each other?



10. Will the magnets in the figure above attract or repel each other?

Station 2 use the textbooks provided to answer the following questions.

11. Where is Earth's magnetic N pole located?

12. Where is Earth's magnetic S pole located?

16. Is the north pole of Earth a magnetic north pole or a magnetic south pole? Explain.

17. Does a magnetic field exist only at a magnet's poles? Explain.

18. Is it possible to break a magnet into two pieces so one of the pieces has just one pole? Explain.

24. The Earth is surrounded by magnetic field lines. Where are these lines densest?

25. Explain why Earth's magnetic North Pole would be a south pole of a bar magnet.

Station 3 – use the textbooks to answer the following questions.

5.The statement that a voltage can be induced in a conductor by a changing magnetic field is known as _____ law.

6. Moving a magnet through a wire coil can produce a(an) _____ in the coil.

13. Explain how an electromagnet works.

19. Name two ways of increasing the magnetic field of an electromagnet.

Station 4 – use the textbooks to answer the following questions.

14. What is the primary purpose of a motor in terms of energy?

13. A(An) _____ converts electrical energy into mechanical energy.

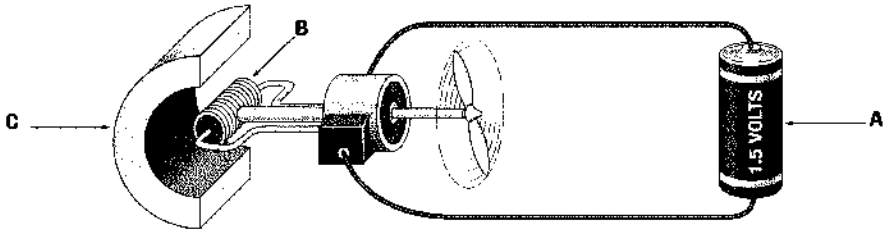


Figure 8-2

20. Which structure in Figure 8-2 is the permanent magnet?

21. Which structure in Figure 8-2 is the power source?

22. Which structure in Figure 8-2 will become an electromagnet when current is supplied?

Station 5 – use the textbooks to answer the following questions.

15. What is the primary purpose of a generator in terms of energy?

Station 6 – use the textbooks and the diagrams to answer the following questions.

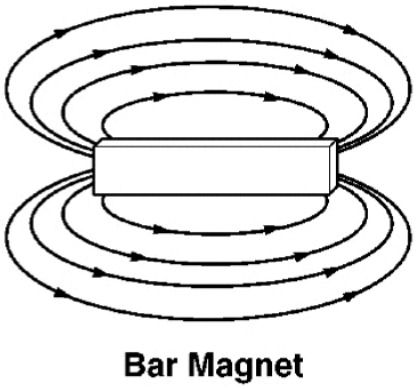
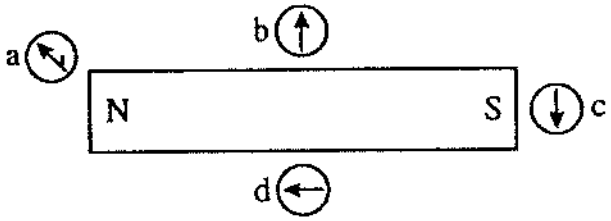


Figure 21-2

23. In Figure 21-2, what do the lines around the bar magnets represent?

26. What is the difference between a temporary magnet and a permanent magnet in terms of the magnetic domains?

27. How does the strength of an electromagnet depend on the current and the number of turns in the coil?



28. Draw the direction the compass needle points in each of the following areas around a magnet

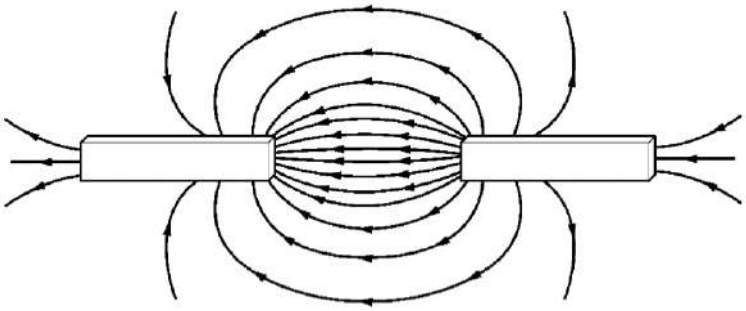


Figure 21-1

29. Lable the poles to the magnet by paying attention to how the magnetic field lines flow.

Station 7 – answer the following questions.

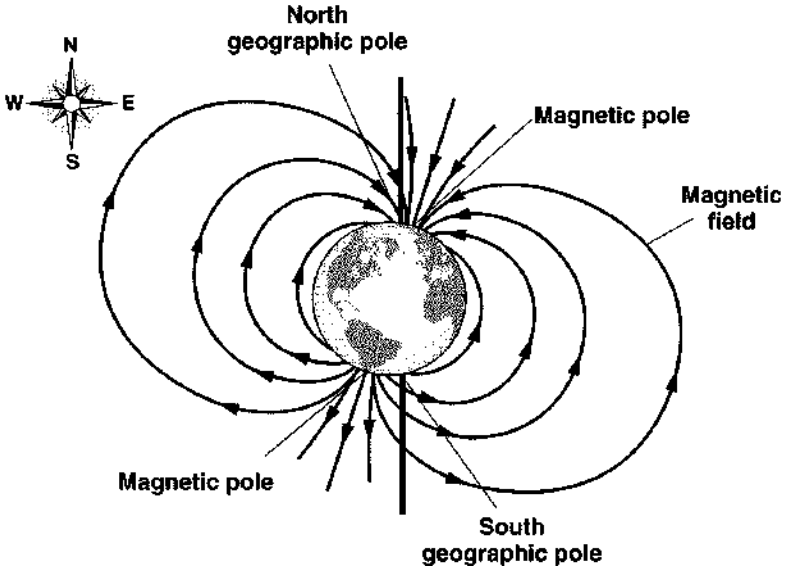


Figure 21-3

30. **Interpreting Graphics** In Figure 21-3, use the direction of the magnetic field lines to determine what type of magnetic pole is located at the geographic North Pole.

31. **Predicting** Use Figure 21-3 to predict where Earth's magnetic field is strongest. Explain your answer.

32. **Interpreting Graphics** In Figure 21-3, where is the magnetic field the weakest?

P Sci Unit 6 Ch. 21 Test
Answer Section

COMPLETION

1. ANS: magnetic field

   PTS: 1 DIF: L1
   OBJ: 21.1.1 Describe the effects of magnetic forces and magnetic fields and explain how magnetic poles determine the direction of magnetic force.
2. ANS: magnetic poles

   PTS: 1 DIF: L2
   OBJ: 21.1.1 Describe the effects of magnetic forces and magnetic fields and explain how magnetic poles determine the direction of magnetic force.
3. ANS: north pole

   PTS: 1 DIF: L2
   OBJ: 21.1.2 Interpret diagrams of magnetic field lines around one or more bar magnets.
   STA: SPS10.c.3
4. ANS: electric motor

   PTS: 1 DIF: L2
   OBJ: 21.2.4 Describe how electromagnetic devices use the interaction between electric currents and magnetic fields. STA: SPS10.c.1
5. ANS: Faraday's

   PTS: 1 DIF: L2
   OBJ: 21.3.1 Describe how electric current is generated by electromagnetic induction.
   STA: SPS10.c.1
6. ANS:
   electric current or
   current or
   voltage

   PTS: 1 DIF: L1
   OBJ: 21.3.1 Describe how electric current is generated by electromagnetic induction.
   STA: SPS10.c.1

SHORT ANSWER

7. ANS:
   The magnets will attract each other.

   PTS: 1 DIF: 1 OBJ: 14-1.1
8. ANS:
   The magnets will repel each other.

   PTS: 1 DIF: 1 OBJ: 14-1.1
9. ANS:
   The magnets will attract each other.

PTS: 1 DIF: 1 OBJ: 14-1.1

10. ANS:
The magnets will repel each other.

PTS: 1 DIF: 1 OBJ: 14-1.1

11. ANS:
Antarctica

PTS: 1 DIF: 1 OBJ: 14-1.4

12. ANS:
Northeastern Canada

PTS: 1 DIF: 1 OBJ: 14-1.4

13. ANS:
When a current flows through a coil of wire, magnetic field lines form around the coil. The more loops of wire, the stronger the magnetic field.

PTS: 1 DIF: A OBJ: 6/2 NAT: B1(5-8) | B2(9-12) | B6(9-12)
STA: 17.7

14. ANS:
to convert electrical energy to mechanical energy

PTS: 1 DIF: A OBJ: 8/2 NAT: B1(5-8) | B2(9-12) | B6(9-12)
STA: 17.7

15. ANS:
to convert mechanical energy to electrical energy

PTS: 1 DIF: A OBJ: 9/3 NAT: B1(5-8) | B2(9-12) | B6(9-12)
STA: 17.7

16. ANS:
Earth's north pole is a magnetic south pole. The north pole of a magnet, e.g. a compass, will be attracted to the Earth's magnetic south pole.

PTS: 1 DIF: A OBJ: 1/1 NAT: B1(5-8) | B2(9-12) | B6(9-12)

17. ANS:
No, but it is strongest at the magnetic poles.

PTS: 1 DIF: A OBJ: 1/1 NAT: B1(5-8) | B2(9-12) | B6(9-12)

18. ANS:
No, no matter how it is broken each piece will be a smaller magnet with two poles.

PTS: 1 DIF: A OBJ: 4/1 NAT: B1(5-8) | B2(9-12) | B6(9-12)

19. ANS:
increase the number of turns of wire, increase the current in the coil, add an iron core to the electromagnet

PTS: 1 DIF: A OBJ: 6/2 NAT: B1(5-8) | B2(9-12) | B6(9-12)
STA: 17.7

20. ANS:
C

PTS: 1 DIF: B OBJ: 6/2 NAT: B1(5-8) | B2(9-12) | B6(9-12)
STA: 17.7

21. ANS:
A

PTS: 1 DIF: B OBJ: 6/2 NAT: B1(5-8) | B2(9-12) | B6(9-12)
STA: 17.7

22. ANS:
B

PTS: 1 DIF: B OBJ: 6/2 NAT: B1(5-8) | B2(9-12) | B6(9-12)
STA: 17.7

23. ANS:
The lines are field lines representing the magnetic field around the magnets.

PTS: 1 DIF: L1
OBJ: 21.1.2 Interpret diagrams of magnetic field lines around one or more bar magnets.
STA: SPS10.c.3

24. ANS:
These lines are densest at the poles.

PTS: 1 DIF: L2
OBJ: 21.1.3 Describe Earth's magnetic field and its effect on compasses.
STA: SPS10.c.3

25. ANS:
Opposite poles of magnets will attract each other, so the magnetic North Pole must be a south pole because it attracts the north pole of a compass needle.

PTS: 1 DIF: L2
OBJ: 21.1.3 Describe Earth's magnetic field and its effect on compasses.
STA: SPS10.c.3

26. ANS:
In a temporary magnet, the magnetic domains only remain aligned for a short time, but in a permanent magnet, the domains remain aligned for a long time.

PTS: 1 DIF: L1
OBJ: 21.1.4 Explain the behavior of ferromagnetic materials in terms of magnetic domains.
STA: SPS10.

27. ANS:
As current in the solenoid and the number of turns in the coil increase, the strength of the electromagnet increases.

PTS: 1 DIF: L1
OBJ: 21.2.3 Explain how solenoids and electromagnets are constructed and describe factors that affect the field strength of both. STA: SPS10.c.1

28. ANS:
x

PTS: 1

29. ANS:
x

PTS: 1

OTHER

30. ANS:
The magnetic pole near the geographic North Pole is a south magnetic pole.

PTS: 1 DIF: L1
OBJ: 21.1.1 Describe the effects of magnetic forces and magnetic fields and explain how magnetic poles determine the direction of magnetic force.

31. ANS:
Earth's magnetic field is strongest at the magnetic North Pole and at the magnetic South Pole. The field lines are closest together in these regions.

PTS: 1 DIF: L1
OBJ: 21.1.3 Describe Earth's magnetic field and its effect on compasses.
STA: SPS10.c.3

32. ANS:
midway between the poles, and far from Earth's surface

PTS: 1 DIF: L1
OBJ: 21.1.3 Describe Earth's magnetic field and its effect on compasses.
STA: SPS10.c.3