

BOT Physical Science B

Name: _____

Date: _____

1. A wet shirt is put on a clothesline to dry on a sunny day. The shirt dries because water molecules 1. _____

A. gain heat energy and condense B. gain heat energy and evaporate
C. lose heat energy and condense D. lose heat energy and evaporate

2. Which energy source is renewable? 2. _____

A. oil B. solar C. coal D. natural gas

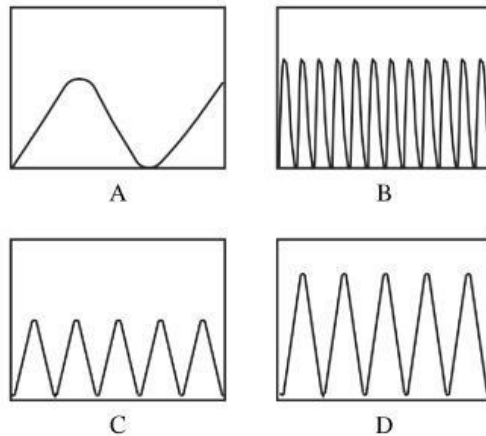
3. Which statement best describes the property of light waves illustrated in the diagram below? 3. _____



A. Some materials absorb light waves.
B. Some materials reflect light waves.
C. Light waves are refracted by some materials.
D. Light waves are emitted by some materials.

4. The drawings below represent four different forms of electromagnetic energy.

4. _____



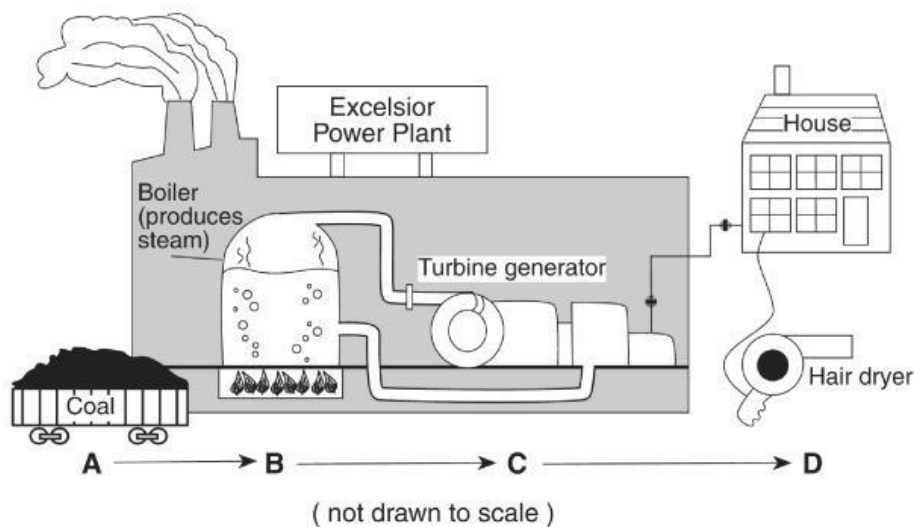
Which diagram represents electromagnetic energy with the shortest wavelength?

- A. A B. B C. C D. D
5. Skiers often wear sunglasses while they are skiing because snow
- A. radiates light B. absorbs light C. conducts light D. reflects light

5. _____

6. The diagram below shows the steps necessary to produce the energy needed to run a hair dryer.

6. _____

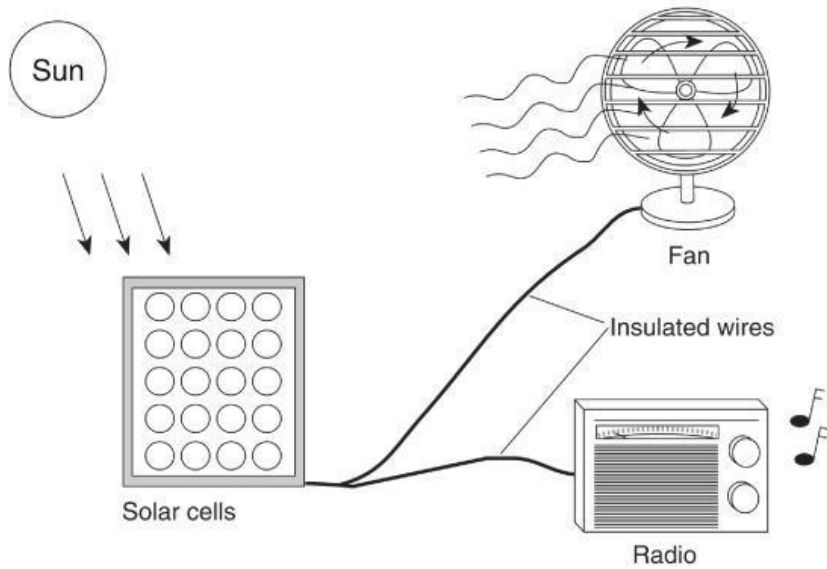


As it moves from location A to location D in the diagram, the energy stored in the coal

- A. is converted to solar energy B. reduces the friction in the hair dryer
- C. is recycled D. is transformed

7. The illustration below shows an example of energy changing forms.

7. _____



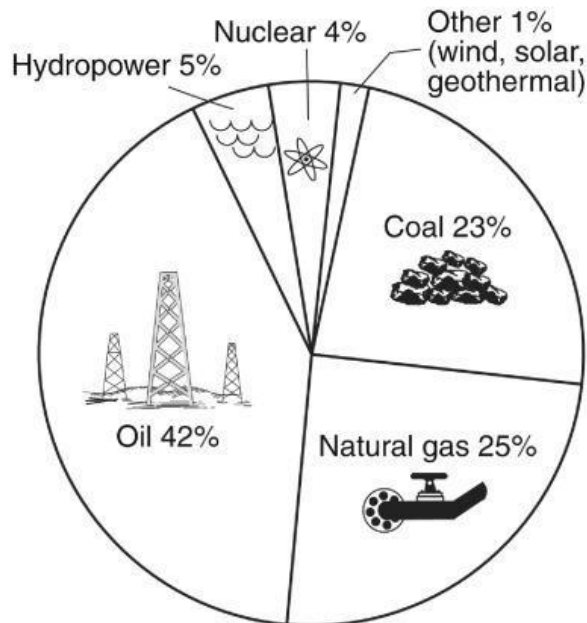
(not drawn to scale)

Which changes in energy form are illustrated in the diagram?

- A. electrical → sound → light and mechanical
- B. sound → mechanical → light and electrical
- C. mechanical → light → sound and electrical
- D. light → electrical → mechanical and sound

8. The pie chart below compares the amounts of energy from different sources used in the United States each year.

8. _____



Which two energy sources together provide more than 50% of the energy needs of the United States?

- A. nuclear and natural gas
B. hydropower and oil
C. oil and coal
D. natural gas and coal
9. Base your answers to the questions on the information and chart below.

9. _____

The chart below shows temperature readings recorded every minute while a substance was being heated at a constant rate. The material was a solid before heating and a hot liquid after 7 minutes of heating.

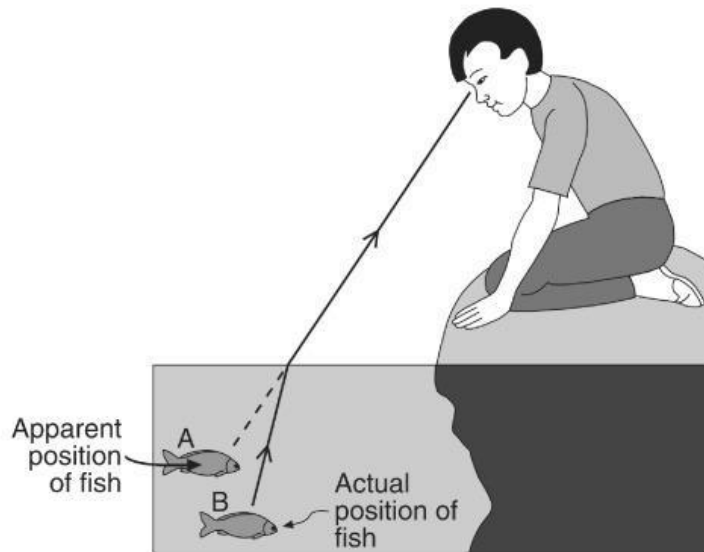
Time (min)	Temp ($^{\circ}\text{C}$)
0	22
1	35
2	53
3	53
4	53
5	53
6	58
7	65

Based on the data, at what temperature did a phase change take place?

- A. 35°C
B. 53°C
C. 58°C
D. 65°C

10. The diagram below shows a boy observing a fish located at position *B* below the surface of the water. The boy sees the fish at position *A*.

10. _____



The apparent position of the fish is different from the actual position of the fish. What has happened to the light passing through the water to cause this difference?

- A. reflection B. absorption C. compression D. refraction
11. A common characteristic of sound waves is that they

11. _____

- A. are created by vibrations
B. travel in straight lines toward the source
C. travel fastest through empty space
D. move at the speed of light

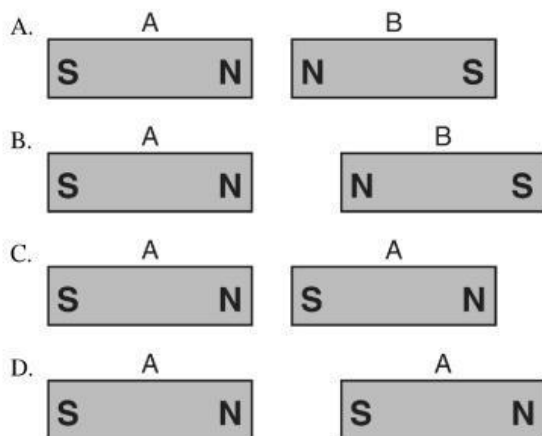
12. Energy from the Sun reaches Earth mainly by the process of

12. _____

- A. conduction B. convection C. reflection D. radiation

13. Magnets *A* and *B* are of equal magnetic strength. In which position will magnets *A* and *B* have the greatest attractive force toward each other?

13. _____



14. Which energy source is considered a *nonrenewable* resource?

14. _____

A. solar B. wind C. moving water D. fossil fuel

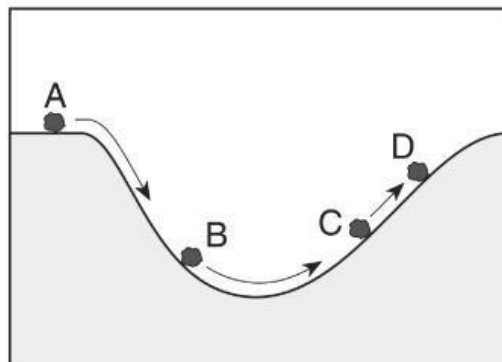
15. A television set changes electrical energy to sound and light energy. In this process, some energy is

15. _____

A. created B. destroyed
C. changed to matter D. changed to heat

16. The diagram below shows a boulder rolling down a hill into a valley and then up the opposite hill.

16. _____

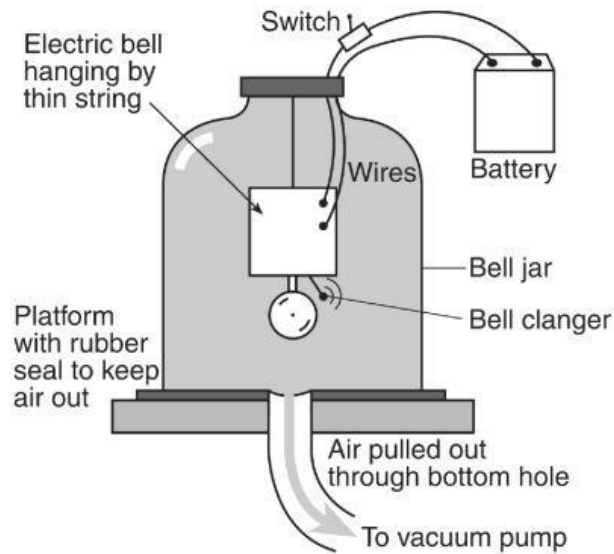


At which position does the boulder have the greatest kinetic energy?

A. *A* B. *B* C. *C* D. *D*

17. The picture below shows a ringing bell inside a vacuum jar.

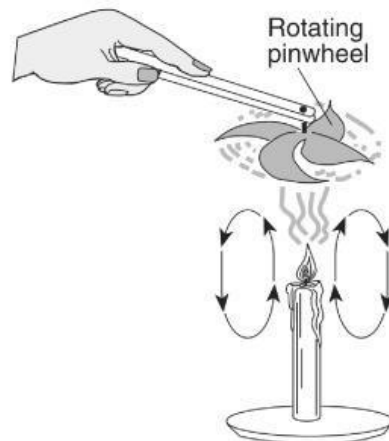
17. _____



As air is pumped from the vacuum jar, the sound level of the ringing bell will decrease until it can no longer be heard. This happens because air must be present in the jar in order for

- A. sound to be transferred B. electricity to flow through the wires
C. the rubber to seal the jar D. the bell clanger to vibrate
18. The diagram below shows a pinwheel rotating above a lit candle. The arrows indicate the direction of air flow.

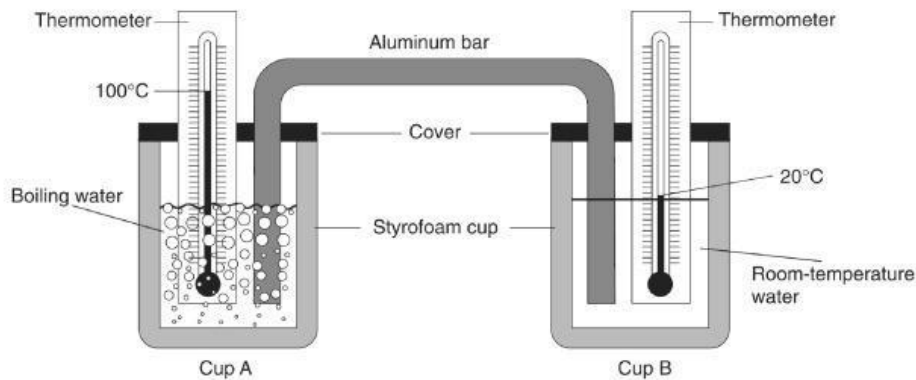
18. _____



Which energy transformation is best shown in this diagram?

- A. heat to mechanical B. mechanical to light
C. sound to heat D. heat to sound

19. Base your answers to the questions on the diagram below, which shows two insulated Styrofoam cups of water connected by an aluminum bar. The thermometers show the temperature of the water in cup A and cup B at the beginning of a heat-flow experiment.

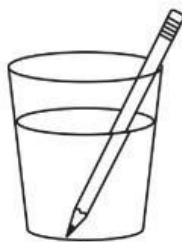


Over the next 15 minutes, which changes would most likely occur?

- A. The temperature in cup A will decrease and the temperature in cup B will increase.
 - B. The temperature in cup A will decrease and the temperature in cup B will decrease.
 - C. The temperature in cup A will increase and the temperature in cup B will increase.
 - D. The temperature in cup A will increase and the temperature in cup B will decrease.
20. Which process is most responsible for the temperature changes that will take place?

- A. radiation of heat from the water in the cups to the thermometers
- B. conduction of heat through the aluminum bar
- C. radiation of heat from the water in the cups into the air
- D. conduction of heat through the air to the water in the cups

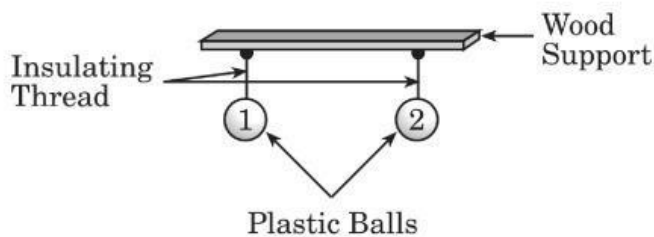
21. The diagram below shows a pencil in a glass of water.



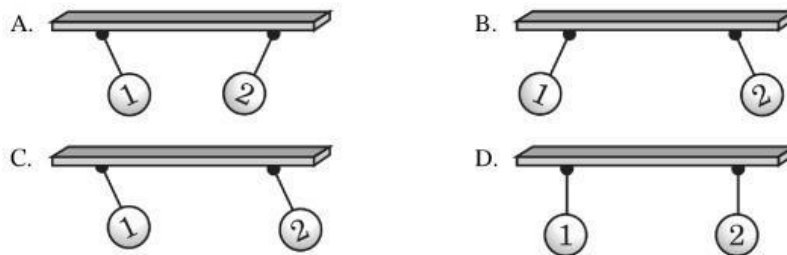
When viewed from the side, the pencil appears to be broken. What process causes this to happen?

- A. absorption
- B. evaporation
- C. reflection
- D. refraction

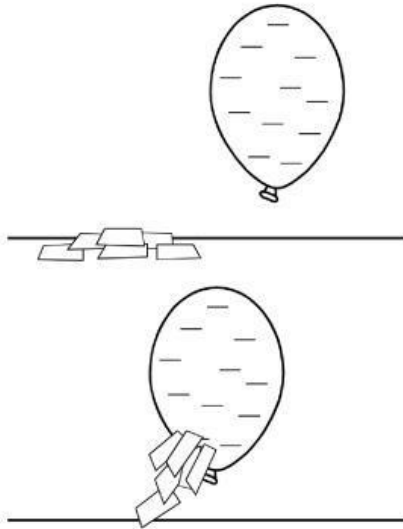
22. When a plastic rod is rubbed with fur, the plastic rod becomes negatively charged. Which statement explains the charge transfer between the plastic rod and the fur? 22. _____
- A. Protons are transferred from the plastic rod to the fur.
 B. Protons are transferred from the fur to the plastic rod.
 C. Electrons are transferred from the plastic rod to the fur.
 D. Electrons are transferred from the fur to the plastic rod.
23. How do electrically charged objects affect neutral objects when they come in contact? 23. _____
- A. Electrons move from negatively charged objects to neutral objects.
 B. Electrons move from neutral objects to negatively charged objects.
 C. Protons move from positively charged objects to neutral objects.
 D. Protons move from neutral objects to positively charged objects.
24. The drawing shows two uncharged lightweight plastic balls suspended by thin, insulating threads. Ball 1 is given a positive charge. Ball 2 is given an equivalent negative charge. 24. _____



Which diagram *best* shows how the balls will react after becoming charged?



25. This diagram shows a negatively charged balloon. When the charged balloon is brought near some pieces of paper, the papers are attracted to the balloon.



Which describes the charging of the pieces of paper?

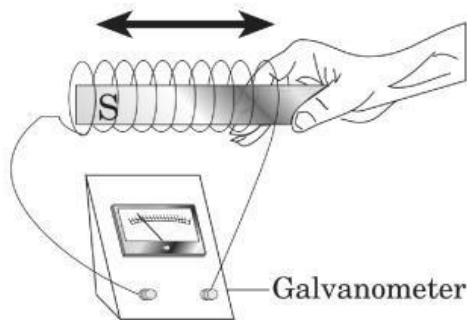
- A. positive, due to induction B. positive, due to conduction
C. negative, due to induction D. negative, due to conduction
26. A sheet of paper is positioned to completely cover a bar magnet. Iron filings are then gently sprinkled on the paper. What does the pattern created by the iron filings indicate?
- A. the stronger of the two poles
B. the distance between the two poles
C. the midpoint of the area between the two poles
D. the magnetic field created by the two poles

25. _____

26. _____

27. A magnet is moved back and forth through a loop of wire as shown below.

27. _____



What will happen as the magnet is moved back and forth as shown?

- A. The wire will attract the magnet.
B. The magnet will attract the wire.
C. The galvanometer needle will stay at 0 on the scale.
D. The galvanometer needle will move back and forth.
28. Which statement *best* describes a bar magnet that has been broken into two pieces?
- A. Both pieces have lost their magnetic poles.
B. One piece has a north pole only, and the other piece has a south pole only.
C. Each piece has both a north and a south pole.
D. Both pieces have a north pole only.
29. A student coiled wire around a nail, attached both ends to a 1.5-V battery, and attempted to lift paper clips with the nail.

28. _____

29. _____

Results

Number of Turns of Wire	Paper Clips Picked Up
10	2
20	4
30	10
40	20

What is a valid conclusion for this investigation?

- A. Increasing voltage increases electromagnetic strength.
B. Increasing the number of turns of wire decreases electromagnetic strength.
C. Increasing the number of turns of wire increases electromagnetic strength.
D. Increasing the number of turns of wire has no effect on electromagnetic strength.

30. Which statement *best* explains why there could be a force of attraction between two electrically charged objects?

30. _____

- A. because they have like charges
- B. because they have unlike charges
- C. because they have the same number of protons
- D. because they have the same number of electrons

31. If the north poles of two bar magnets are brought together, which is true?

31. _____

- A. The two north poles will repel each other.
- B. The two north poles will attract each other.
- C. No force will be experienced between the two magnets.
- D. One north pole will become a south pole due to the interaction.

32. How could 3 magnets be arranged end-to-end so that there will be no attraction between them?

32. _____

- A.

N	S
---	---

S	N
---	---

N	S
---	---
- B.

S	N
---	---

N	S
---	---

N	S
---	---
- C.

N	S
---	---

N	S
---	---

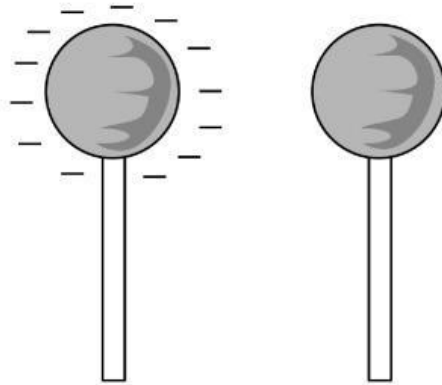
S	N
---	---
- D.

S	N
---	---

S	N
---	---

S	N
---	---

33. This diagram shows two copper spheres. Sphere 1 is negatively charged, and Sphere 2 is neutral.



Sphere 1

Sphere 2

What will be the result when the two spheres touch?

- A. Sphere 1 will become positively charged.
- B. Sphere 2 will become positively charged.
- C. Both spheres will become negatively charged equal to the initial charge of Sphere 1.
- D. Both spheres will become negatively charged less than the initial charge of Sphere 1.

34. Which waves require a medium for transmission?

A. light waves B. radio waves C. sound waves D. cosmic waves

35. An echo heard when a person shouts in a canyon is due to the sound waves being

A. mixed B. refracted C. diffracted D. reflected

36. As a sound wave passes from a region of cool air to a region of warm air, its speed will

A. decrease B. increase C. remain the same

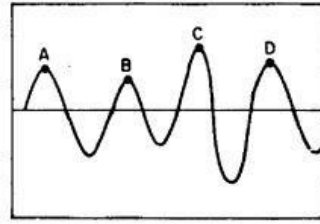
37. A point in a sound wave at which the particles of the transmitting medium are farther apart than when at the rest position is called a

A. compression B. crest C. trough D. rarefaction

38. If the tongs of a vibrating tuning fork touch a water surface, the water splashes, this is evidence that sound is a form of _____
- A. atomic energy B. chemical energy
C. heat energy D. mechanical energy
39. A term often used to describe the frequency of a sound is _____
- A. amplitude B. volume C. pitch D. tone
40. The reflection of a sound wave from a wall is called _____
- A. an echo B. a condensation
C. a rarefaction D. the Doppler effect
41. Increasing the amplitude of a sound wave will make it _____
- A. louder B. have a higher pitch
C. travel faster D. produce beats
42. In general, compared to the speed of sound through air, the speed of sound through liquids and solids is _____
- A. slower B. faster C. the same
43. The echo of a sound is produced by _____
- A. interference B. refraction C. reflection D. resonance
44. A ringing electric bell is placed under a bell jar on a vacuum pump and the air is drawn from the space around the ringing bell. As the air is removed, the magnitude of the sound of the bell _____
- A. decreases B. increases C. remains the same
45. Sound can *not* be transmitted through a _____
- A. gas B. liquid C. solid D. vacuum

46. The diagram shown is a representation of sound waves on an oscilloscope. The pattern was produced by varying the loudness of a sound. Which point represents the loudest sound?

A. A B. B C. C D. D



46. _____

47. As the frequency of a sound wave decreases, its pitch

A. decreases B. increases C. remains the same

47. _____

48. As a sound wave travels through air, there is a net transfer of

A. energy, only B. mass, only
C. both mass and energy D. neither mass nor energy

48. _____

49. The amplitude of a sound wave is to its loudness as the amplitude of a light wave is to its

A. brightness B. frequency C. color D. speed

49. _____

50. What type of wave is sound traveling in water?

A. torsional B. transverse C. elliptical D. longitudinal

50. _____

51. An electric guitar is generating a sound of constant frequency. An increase in which sound wave characteristic would result in an increase in loudness?

A. speed B. period C. wavelength D. amplitude

51. _____

52. Which type of wave requires a material medium through which to travel?

A. sound B. radio C. television D. x ray

52. _____