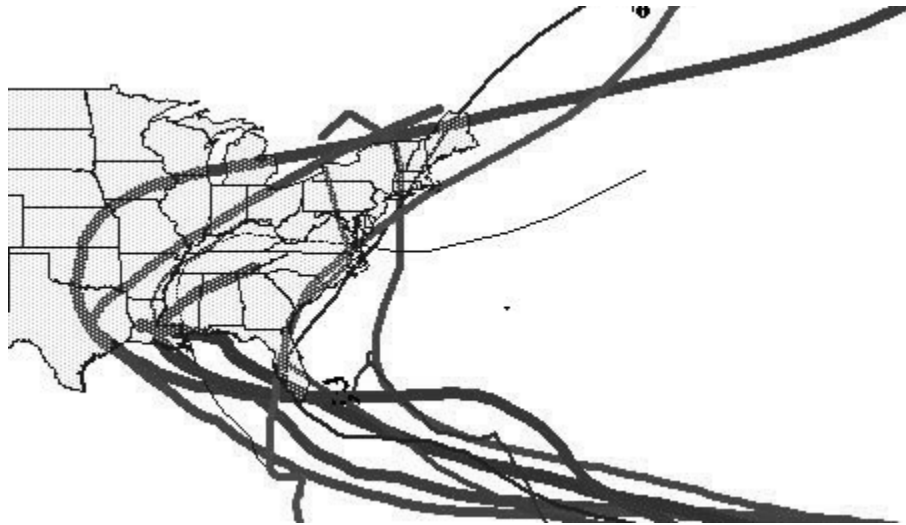
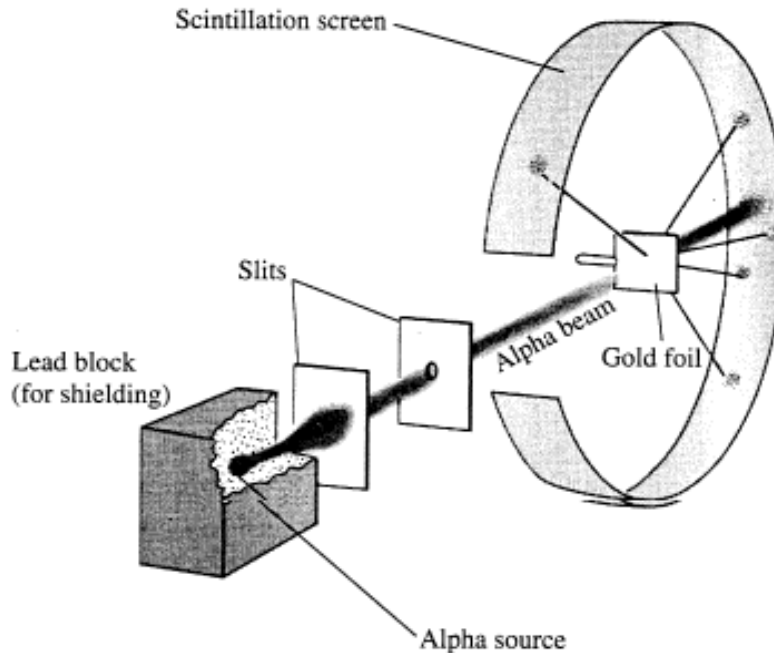


33. Scientists have noted a significant increase in tropical cyclone activity in the Atlantic Ocean in the past few years. While the scientific community has not agreed upon a reason, large numbers of scientists suggest the increase is due to
- A. better instrumentation that can detect tropical cyclones in the Atlantic Ocean.
 - B. increased earthquake and volcanic activity worldwide.
 - C. a decrease in the number of tropical cyclones in the Pacific Ocean.
 - D. above normal sea surface temperatures.



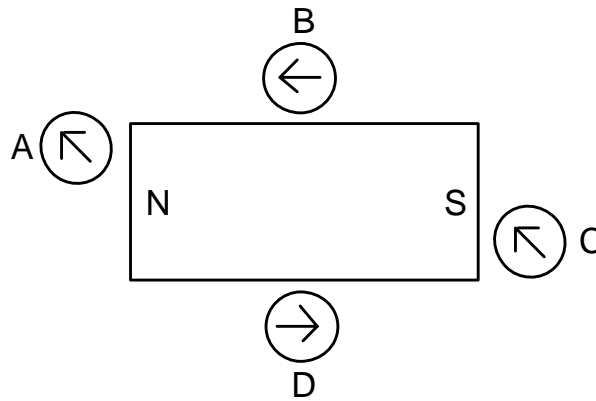
34. The map above depicts some of the most destructive hurricanes ever to hit the United States. Take note that most of these tropical cyclones moved westward from where they initially formed, curved northward, and then exited the United States by moving to the east. The best explanation for this behavior is that
- A. trade winds initially drive these storms westward, and the westerlies later carry them out to sea after turning northward.
 - B. the westerlies initially drive these storms westward, and the easterlies later carry them out to sea after turning northward.
 - C. trade winds initially drive these storms westward, and the easterlies later carry them out to sea after turning northward.
 - D. the westerlies initially drive these storms westward, and the trade winds later carry them out to sea after turning northward.
35. On June 21, which city will receive the most direct (intense) incoming solar radiation at midday?
- A. Birmingham, England, 52°N latitude
 - B. Asuncion, Paraguay, 25°S latitude
 - C. Bogota, Colombia, 4°N latitude
 - D. Canton, China, 23°N latitude



37. Consider the famous Rutherford Gold Foil experiment (illustrated above). What important conclusion did Rutherford draw as a result of his experiment?
- A. Alpha particles are very important to science.
 - B. Atoms carry charged particles called electrons.
 - C. Atoms have small, incredibly dense regions where positively charged particles are found.
 - D. Alpha particles are attracted to gold foil.
38. Which of the following bonds within the compounds listed forms bonds with the greatest ionic character?
- A. H_2
 - B. HF
 - C. H_2O (the OH bond)
 - D. NH_3 (the NH bond)
39. Which substance is always present both before and after a chemical reaction occurs?
- A. catalyst
 - B. reactant
 - C. product
 - D. intermediate

40. Fluorine-18 is a radioactive element. As it decays, the most likely daughter element it may transmutate into is
- A. Neon-19.
 - B. Neon-18.
 - C. Oxygen-17.
 - D. Oxygen-18.
41. Consider the compound with the formula X_2O_3 . If X is determined to be a transition metal, what is its oxidation state within this compound?
- A. -2
 - B. -3
 - C. +2
 - D. +3
42. Metals owe their physical properties of malleability and conductivity to the fact that they
- A. have few valence electrons.
 - B. have high atomic numbers.
 - C. all have high melting points.
 - D. have nearly complete valence orbitals.
43. Two objects, object A and object B, with equal masses are moving at a velocity of 2 m/s and 4 m/s, respectively. What is the ratio of the kinetic energy of object A to that of object B?
- A. 1:1
 - B. 1:2
 - C. 1:4
 - D. 1:16
44. An artificial satellite with a mass of 100 kg is orbiting Earth at an altitude of 600 km. If it were possible, which of the following actions would cause the greatest reduction in the gravitational attraction between the satellite and Earth?
- A. reduce its mass by 50%
 - B. increase its mass by 50%
 - C. increase its orbital distance to double the distance between the center of the two bodies
 - D. decrease its orbital distance to halve the distance between the center of the two bodies

45. One method of identifying the point on the surface where Earth's magnetic pole is located is to use a compass to point
- A. due north from that point.
 - B. due south from that point.
 - C. perpendicular to Earth's surface at that point.
 - D. parallel to Earth's surface at that point.



46. Study the bar magnet pictured above. Which compass needle is pointing in the wrong direction?
- A. A
 - B. B
 - C. C
 - D. D
47. Which of the following free body diagrams describes a force applied to a sturdy box being dragged across a tiled floor with acceleration to the right?

