

# LIGHTNING!

50min



1. There are ten million lightning bolts around the world each  
**A. year**      **B. day**      **C. minute**      **D. hour**      **E. second**

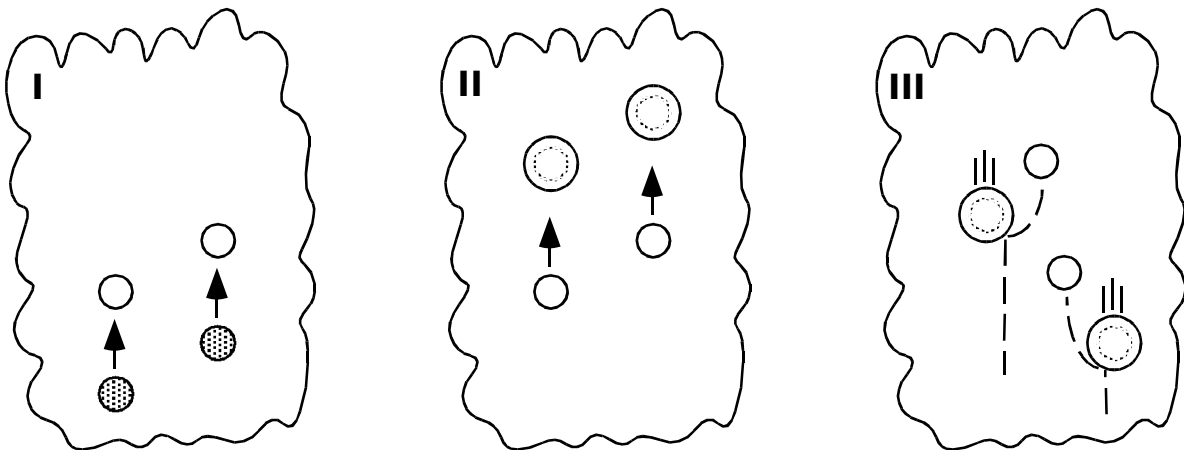
2. (True / False ) Lightning is hotter than the surface of the sun.

3. Lightning kills \_\_\_\_\_ people each year in America.

4. The Thunderbird was a cultural symbol of lightning among the \_\_\_?\_ people.  
**A. Cherokee**      **B. Aztec**      **C. Hopi**  
**D. Aboriginal**      **E. Pueblo**      **F. Navajo**

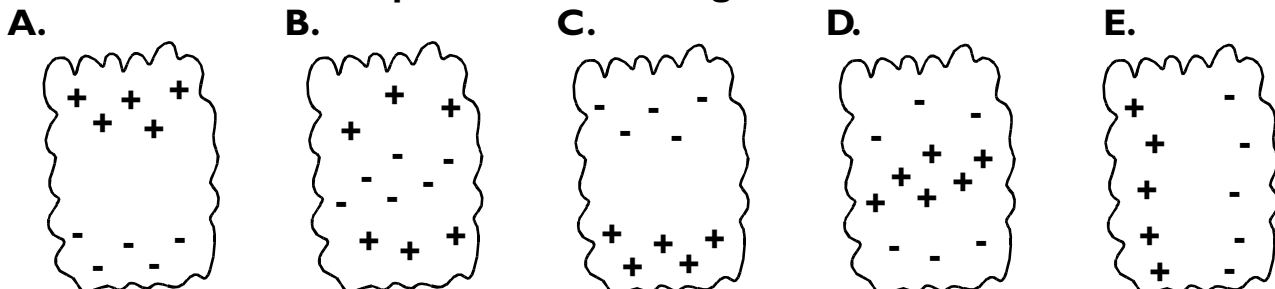
5. What drives water droplets upward in a cloud?  
**A. conduction**      **B. convection**      **C. radiation**

6. Which process is depicted in diagram III of the thundercloud below?



**A. water droplets rise and freeze**  
**B. ice crystals rise; additional water freezes to them and they grow larger**  
**C. falling hailstones collide with rising ice crystals**

7. Which is the best depiction of the charge distribution in a thundercloud?



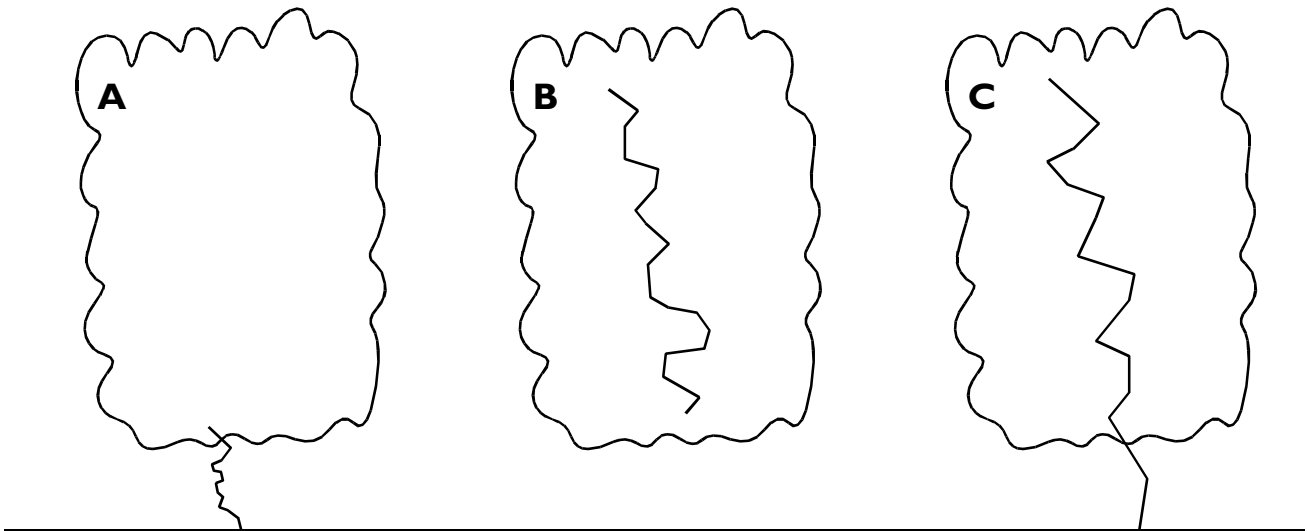
8. For the most part, lightning strike survivors
- A. are unaffected by the strike and go about life as normal
  - B. suffer minor injuries and recover quickly
  - C. suffer severe injuries that remain with them indefinitely

9. For triggered lightning, what does the model rocket tow as it rises into the sky?

10. Among the most effective technologies developed to protect against lightning is a 200 year old device known as a

11. Each bolt of lightning produces its own pulse of

12. Which lightning strike shown below is most likely to produce a sprite?

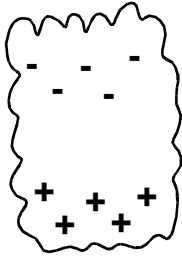


- A. cloud-bottom to ground
- B. cloud-top to cloud-bottom
- C. cloud-top to ground

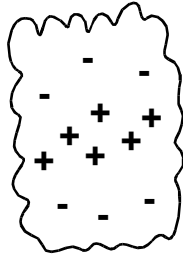


7. Which is the best depiction of the charge distribution in a thundercloud?

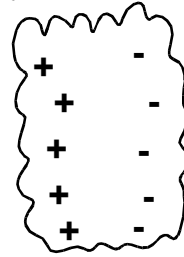
A.



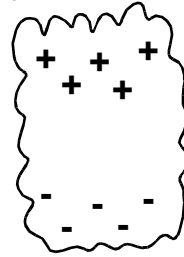
B.



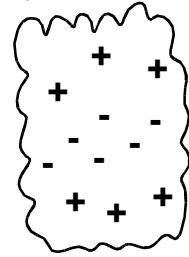
C.



D.



E.



8. For the most part, lightning strike survivors

A. are unaffected by the strike and go about life as normal

B. suffer minor injuries and recover quickly

C. suffer severe injuries that remain with them indefinitely

9. (True / False ) A car is a safe place to be during an electrical storm.

10. NASA's Space Shuttle is

A. launched from a lightning-prone region

B. the tallest structure for miles around

C. both of these

D. none of these

11. A chemical byproduct of lightning is (select all that are correct)

A.  $\text{CO}_2$  (carbon dioxide)

B.  $\text{NO}_3$  (nitrates)

C.  $\text{H}_2\text{O}$  (water)

D.  $\text{O}_2$  (oxygen)

E.  $\text{O}_3$  (ozone)

12. What is the coloration of a sprite?

A. Red top, blue bottom

B. Blue top, red bottom

C. From top to bottom: red, orange, yellow, green, blue, violet

D. From bottom to top: red, orange, yellow, green, blue, violet

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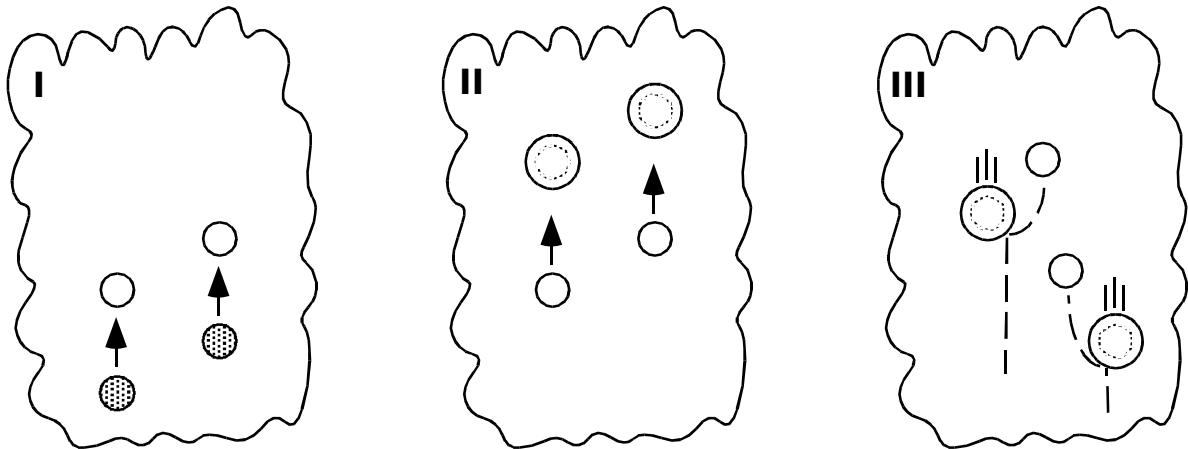
2. At any one moment, there are more than \_\_\_\_\_  
 thunderstorms raging around the world.

3. Lightning injures (but doesn't kill) \_\_\_\_\_ people each year  
 in America.

4. Which of the processes listed below is involved in the formation of clouds?

- A. Pockets of moist air are heated by the sun**
- B. Warmed air rises**
- C. Rising air cools**
- D. Moisture in the cooled rising air condenses**
- E. All of the above**

5. Which process is depicted in diagram II of the thundercloud below?



- A. water droplets rise and freeze**
- B. ice crystals rise; additional water freezes to them and they grow larger**
- C. falling hailstones collide with rising ice crystals**

6. As falling hailstones collide with rising ice crystals, the crystals become

- A. positively charged**
- B. negatively charged**

7. On average, lightning kills one in every \_?\_ people it strikes

- A. 3**
- B. 6**
- C. 9**
- D. 20**
- E. 100**

8. A cloud-to-ground stroke of lightning heats the air it passes through to a temperature over 50,000°F. The sudden expansion of the heated air produces a shock wave known as

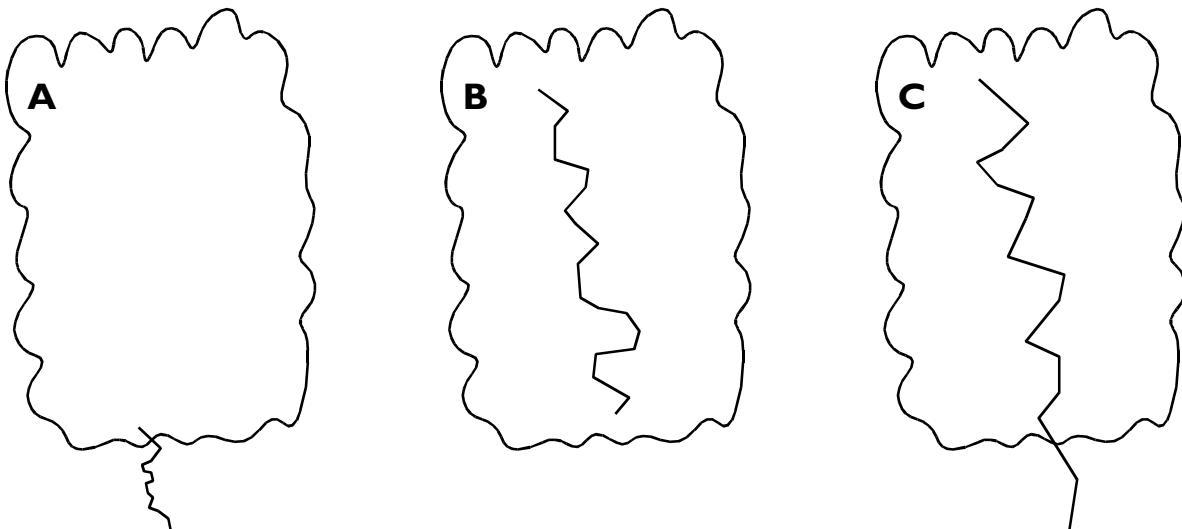
9. (True / False ) A car is a safe place to be during an electrical storm because it has rubber tires (rubber is an electrical insulator).

10. Each bolt of lightning produces its own pulse of

11. A chemical byproduct of lightning is (select all that are correct)

- A.  $O_2$  (oxygen)
- B.  $O_3$  (ozone)
- C.  $CO_2$  (carbon dioxide)
- D.  $NO_3$  (nitrates)
- E.  $H_2O$  (water)

12. Which lightning strike shown below is most likely to produce a sprite?



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- C. cloud-top to ground