



# BOY SCOUTS OF AMERICA

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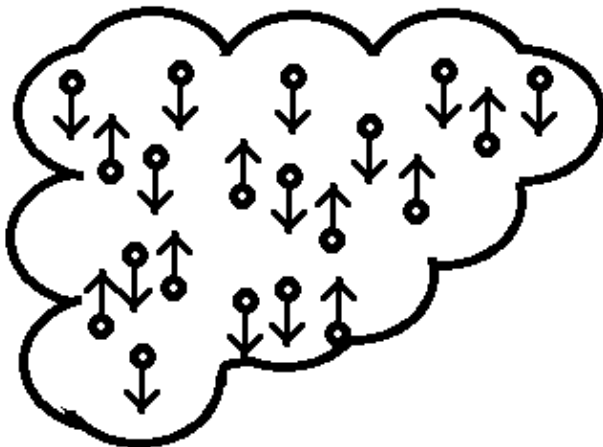
## First Class Requirement 5d

"5d. Describe extreme weather conditions you might encounter in the outdoors ... Lightning!"

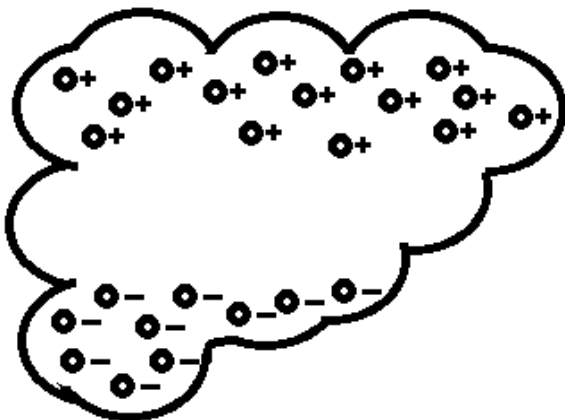
\_\_\_\_\_ Name

### Part 1 - Some Science

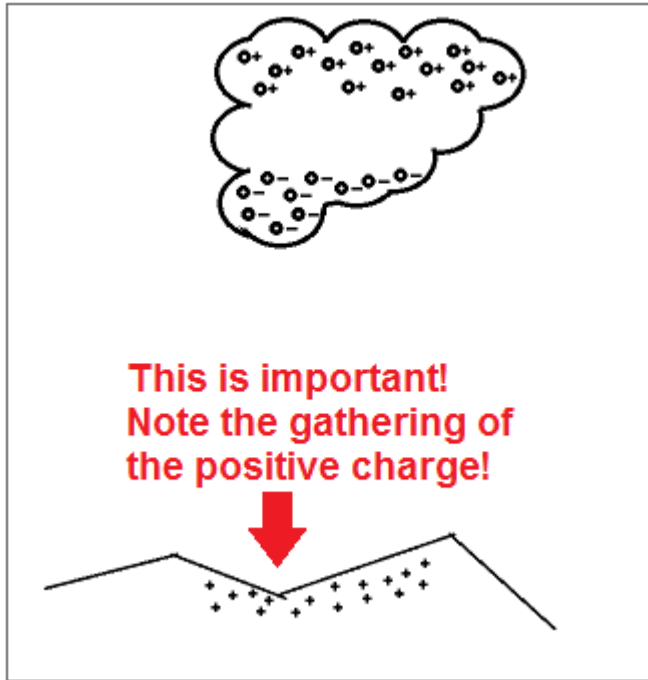
1. Here's a storm cloud, with light particles rising and heavier particles falling. They're in constant motion, and they rub against each other producing static electricity like rubbing a balloon on your hair.



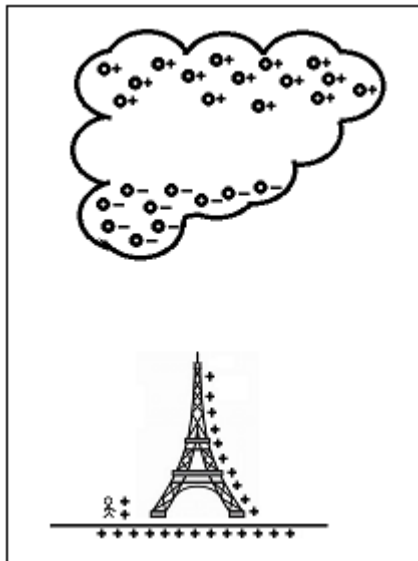
2. After a lot of up-and-down, light positively charged particles will be gathered at the top of the cloud, and heavier negatively-charged particles will be gathered at the bottom.



3. When the cloud hovers over the ground, the ground responds by building up a positive charge underneath the cloud. Lightning is getting ready to strike! What it needs now is a good path to get from the cloud to the ground.



4. Take a look at the this drawing.

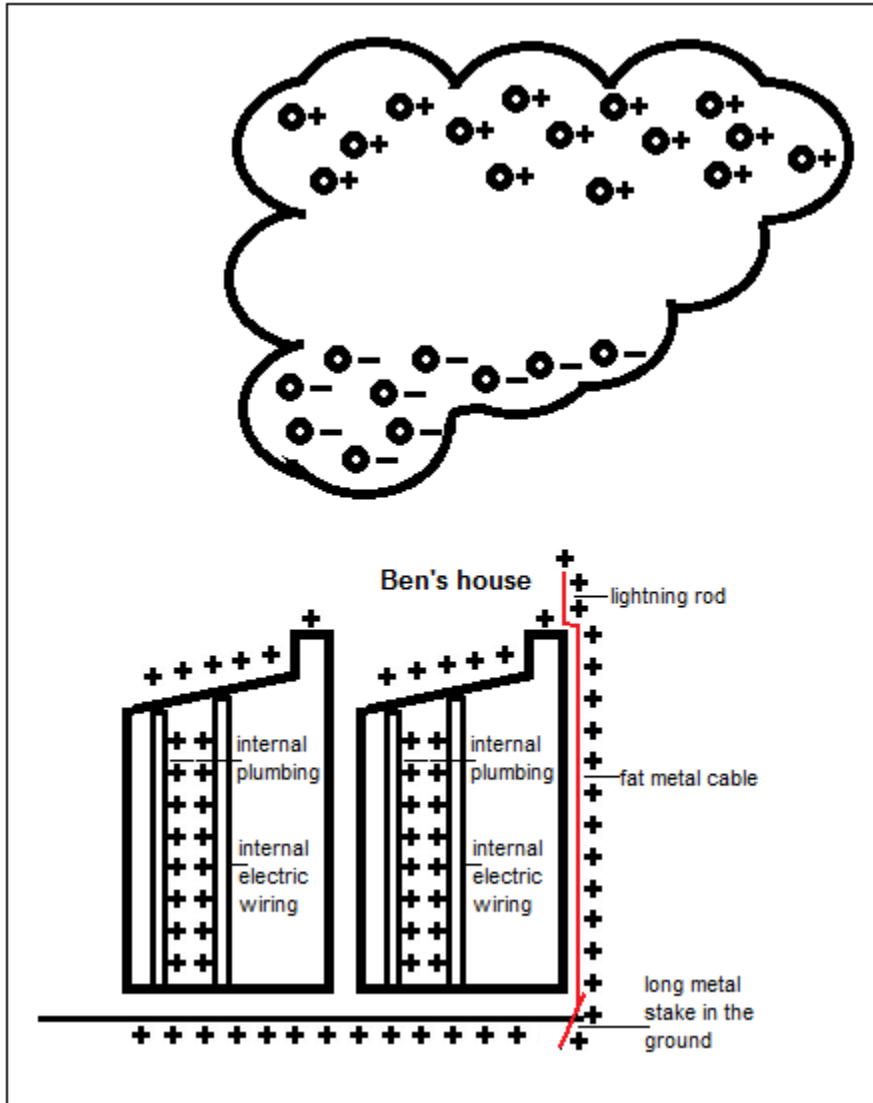


Which offers the easier and more attractive path for lightning to strike?

\_\_\_ The Eiffel Tower offers an easier and shorter path to the ground.

\_\_\_ The standing person offers an easier and shorter path to the ground.

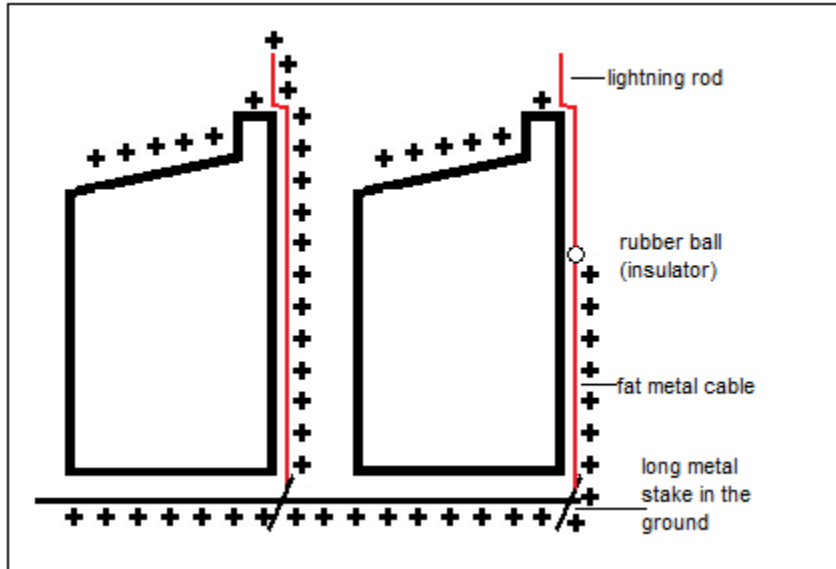
5. Ben Franklin invented the lightning rod. Take a look at Ben's house versus his next-door neighbor.



Which of these two houses offers the easier and more attractive path for lightning to strike?

- \_\_\_ Ben's house offers an easier and shorter path to the ground. The fat metal cable will conduct the lightning's charge away from the house and straight to the ground.
- \_\_\_ The next-door neighbor's house offers a path to the ground that is easier and shorter.

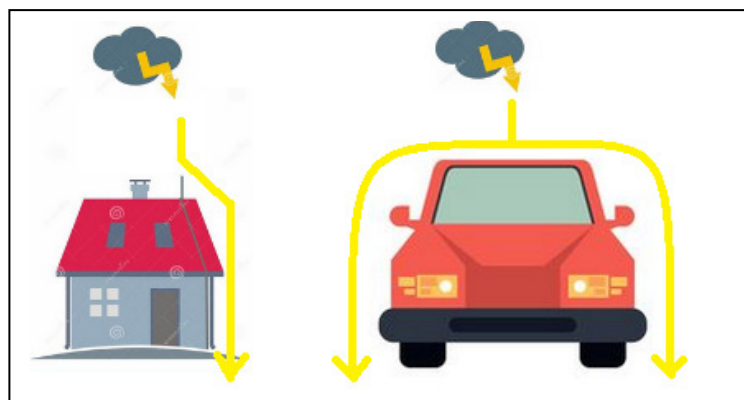
6. Here's a thought-experiment. Both houses have lightning rods, but on the right house, some fool cut the fat metal cable and inserted a rubber ball (insulator) into the gap.



Which lightning rod is the more effective at protecting its house?

- No difference.
- The house on the left is better protected. Its lightning rod offers an easy and attractive path to the ground. The lightning rod on the right was rendered useless by the rubber ball insulator.

7. Cars are considered a safe place to shelter from lightning, because the car's metal shell acts like a lightning rod. **WARNING: DON'T TOUCH ANYTHING METAL!** Best to keep your your hands on your lap!

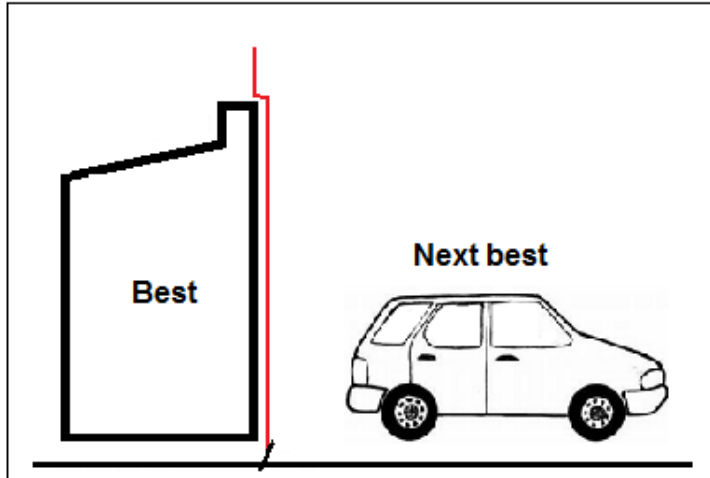


Is it okay to take shelter inside a car during a thunderstorm?

- No! The metal car will attract lightning.
- Yes! The metal car might attract lightning, but the metal shell will conduct the electricity away from the passengers and down into the ground.

## Part 2 - Practical Advice about Lightning

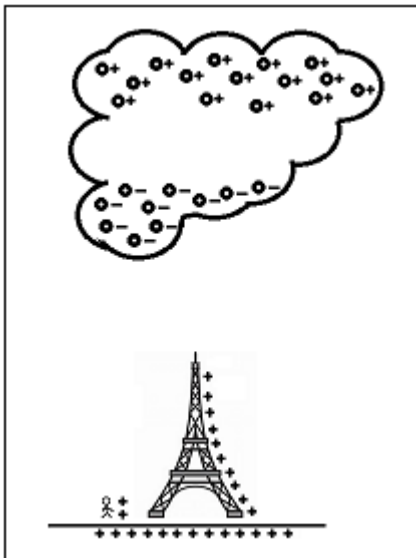
8. **The safest place to shelter is inside a building with a lightning rod. Next safest is inside a car**



**Question:** What's the practical advice you can draw from this picture?

The safest place

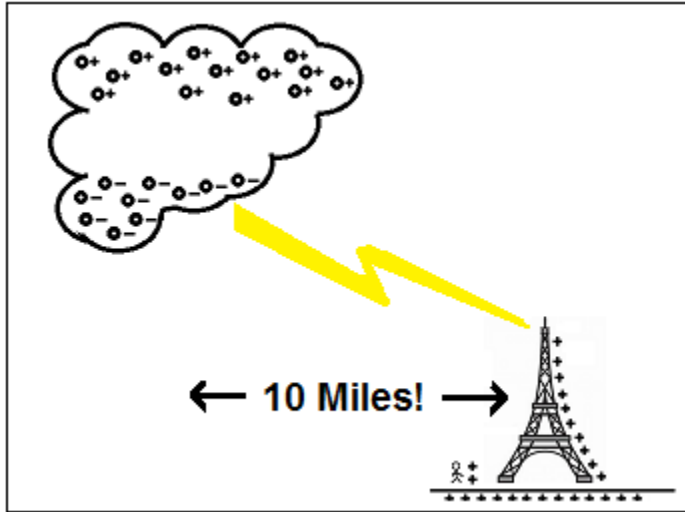
9. **Make sure you're not the highest object in the area.**  
Take another look at the man standing near the Eiffel Tower during a thunderstorm. Clearly the Eiffel Tower offers an easier and shorter path to the ground, so the man can assume that he's safe.



**Question:** What's the practical advice you can draw from this picture?

Make sure

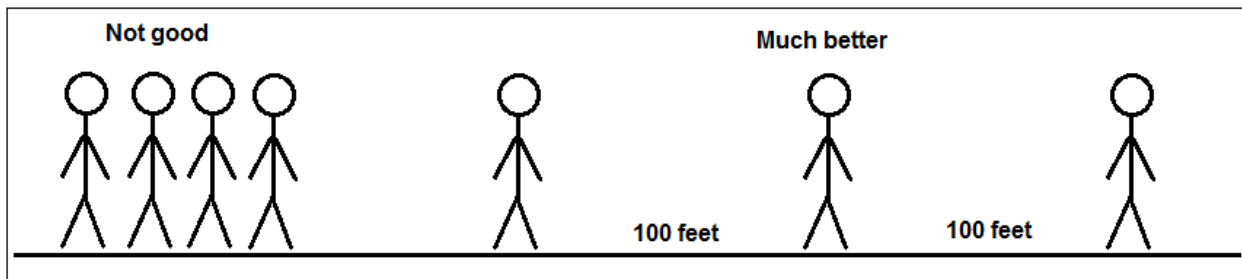
10. **There's a 10-mile danger zone. If you hear thunder, seek shelter.**  
 Take a look at this lightning strike. We like to think that lightning always comes straight down, but in fact it can also move sideways!



**Question:** What's the practical advice you can draw from this picture?

If you hear thunder, \_\_\_\_\_

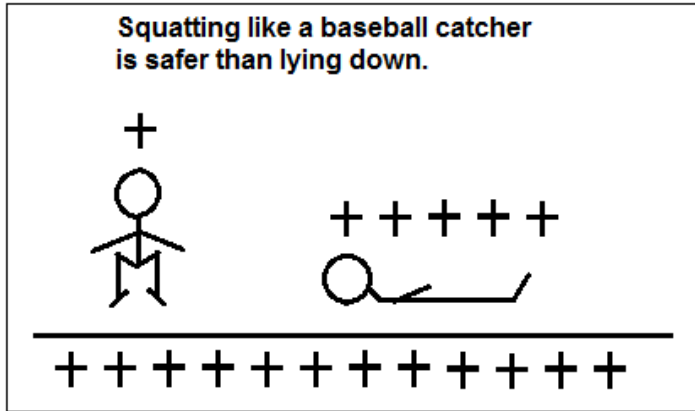
11. **If your patrol is out in the open, spread out 100 feet.**  
 If everyone is bunched together, one unlucky lightning strike can... Well, you get the idea



**Question:** What's the practical advice when your patrol is out in the open?

Everyone should \_\_\_\_\_

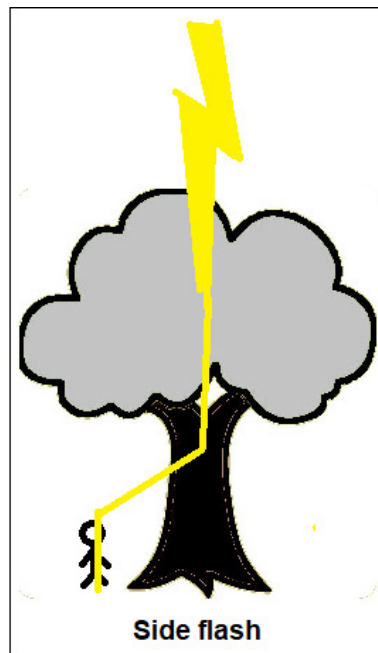
12. **If you're out in the open, squat like a baseball catcher.**  
Squatting gets you pretty low, and it reduces the contact area you have with the ground.



**Question:** What's the practical advice about how to position yourself when you're out in the open?

A good position to take is to

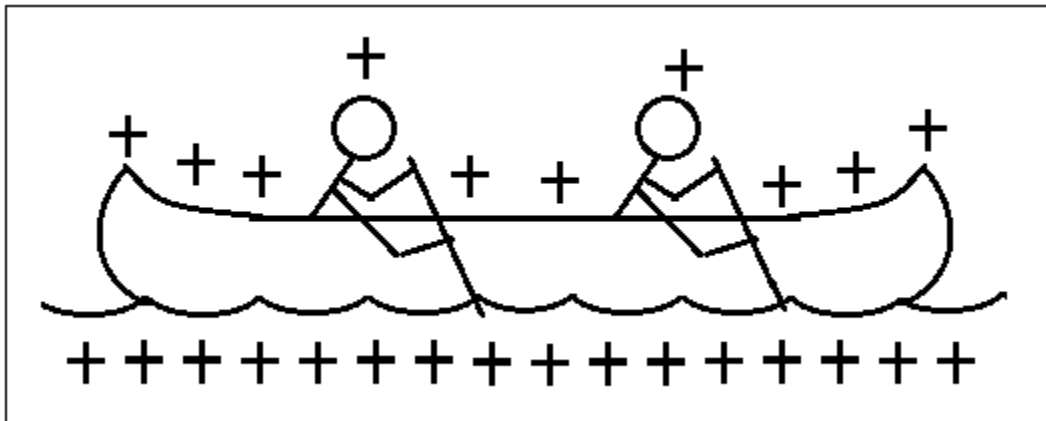
13. **What about sheltering from the rain under a tree? Where's the danger?**  
The problem here is called "Side Flash." If you're standing a foot or two from the trunk of a tree that gets hit, you can act like a "short circuit" for some of the energy in the lightning discharge.



**Question:** What's the practical advice about sheltering under a tree during a thunderstorm?

It's a bad idea due to the possibility of

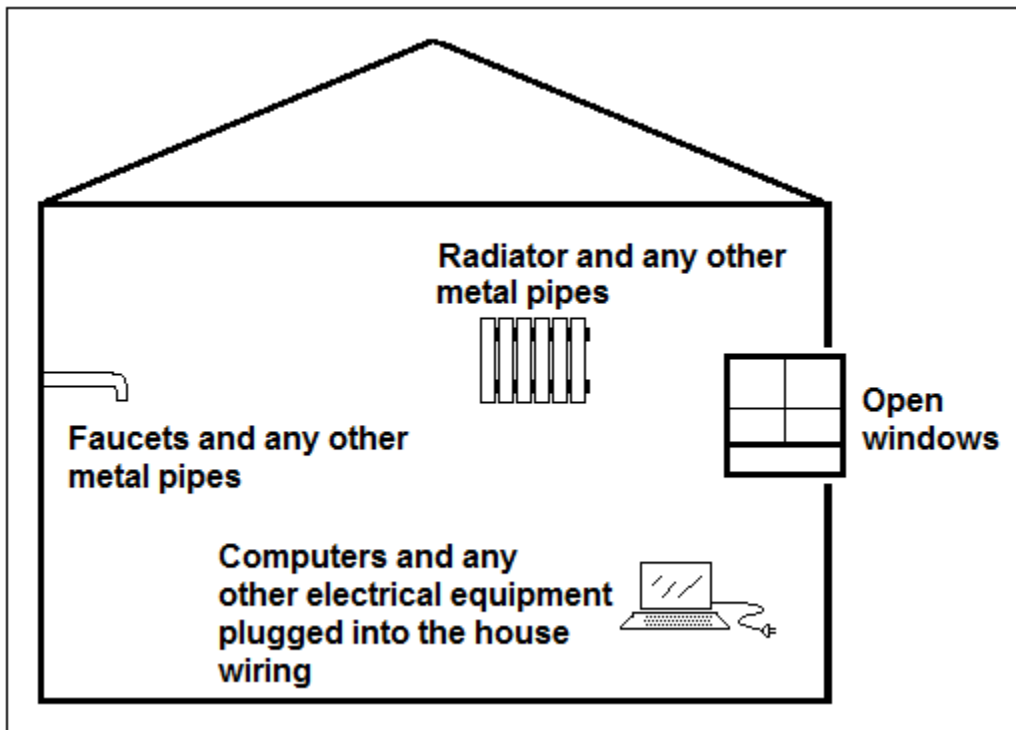
14. **Stay off the water! If you're out in the water, get back to shore quick!**  
Water conducts electricity, which means that lightning can strike a river or a lake. Also, you're the highest object in the area!



**Question:** What's the practical advice about aquatics during a thunderstorm?

Stay off the \_\_\_\_\_

15. **Best to shelter indoors, but avoid windows, metal, and electrical equipment.**



**Question:** What's the practical advice about being extra safe in your house?

Avoid \_\_\_\_\_



16. **Wait 30 minutes after the last sight or sound.**

When do you know that the storm over so you can come out of your shelter? Experts say to wait for 30 minutes to be certain.

**Question:** What's the practical advice about when you can come out from your shelter?

Wait 30\_\_\_\_\_

17. **What if someone got struck by lightning. Is it safe to touch him?**

YES! It's safe to touch someone who got struck by lightning.

**Question:** What's the practical advice if someone is struck by lightning?

   or    It's okay to apply first aid.  
T     F

   or    It's okay to apply CPR  
T     F