

# Lightning Answer Sheet

## LEVEL 1

### Answers to *You're the Scientist: Static Electricity*

1. After rubbing the balloon against your clothes, it will attract your hair and make it “fly” toward the balloon.
2. When you place the balloon against the cereal pieces, it will attract them and grains of cereal will stick to the balloon.
3. After a few minutes, the grains will “fly” off the balloon, repelled rather than attracted. (If you wait a few minutes, the same grains will be attracted once again.)

## LEVEL 2

### Answers to *You're the Scientist: The Leyden Jar*

**Analysis:** When you touch the charged balloon to the nail of the Leyden jar, electrons flow from the nail onto the balloon. This attracts electrons through your hand and onto the aluminum foil. Now the Leyden jar has a positive center that is separated from the negative foil by the insulating plastic of the film canister. When you touch the foil and the nail at the same time, a spark jumps as the negative charges are attracted through you to the positive nail. The Leyden jar stores this charge until it is discharged.

How do these concepts relate to lightning?

Storm clouds are charged like giant capacitors. The upper part of the cloud is positive and the lower part is negative. The discharge is lightning!

### Answers to *Where Lightning Forms, Page 2*

1. Answers will vary, according to your state.
2. Washington has the fewest lightning strikes, with Oregon and California coming in second and third. The cold waters of the Pacific and the cold polar jet stream do not cause a collision of air masses.
3. Florida has the most strikes by far. The coastal areas of Alabama, Mississippi, Louisiana, Georgia and South Carolina follow.

## LEVEL 3

### Answers to *You're the Scientist: The Charge Carrier*

Students will hear a crackle, feel a shock and see a spark.

### Analysis of *You're the Scientist: The Charge Carrier*

- When the foam plate adds electrons, it becomes negatively charged.
- The surrounding air and the insulating foam allow the pan to retain its neutral charge because the electrons cannot leave the pan.
- When you touch the pie pan, electrons flow from the pan and onto your finger.

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- The pan is neutral.
- The flow of electrons makes the spark. The air in the spark is ionized and causes the light and sound.
- The shock is the sensation of electrons flowing through your finger.