Mechanical Universe

STATIC ELECTRICITY

COLLEGE EDITION: 30min

Read the following questions before the video begins. Answer the questions while the video is in progress. This is an INDIVIDUAL effort, so complete it by yourself. DON'T ASK OTHERS FOR ANSWERS since doing so would be cheating. Your neighbor might even have a different set of questions. So copying will likely lead to confusion and error.

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1. Quick in sports and science, the _?_ made an early discovery in electricity

A. magicians **B. street urchins** **C. professors**
D. Romans **E. electricians** **F. Greeks**

2. The mathematical relationship between electric charge and electric force was discovered by

A. The Ancient Greeks **B. Charles Coulomb** **C. Michael Faraday**
D. Benjamin Franklin **E. Robert Van de Graaff** **F. Joseph Leyden**

3. Which is true?

A. To understand electricity, one must understand matter.
B. To understand matter, one must understand electricity.
C. Both of these.
D. None of these.

4. In table salt, which is positive?

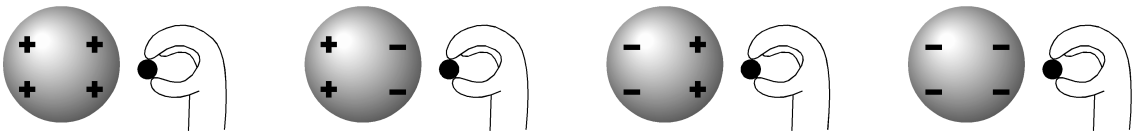
A. Sodium **B. Chlorine** **C. Both** **D. Neither**

5. On an insulator, an electric charge _____ where _____ _____.

6. Mobile electrons are known as _____ electrons.

7. Which diagram correctly depicts a small, positive charge brought near a neutral metal sphere? (Red is positive and blue is negative.)

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



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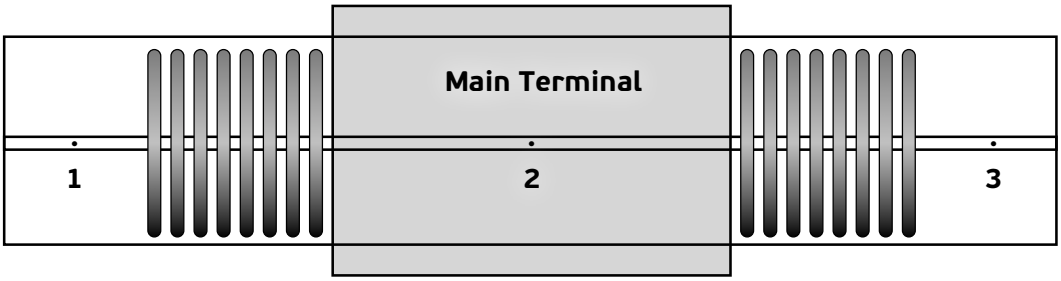
Consider the "business" section of the Van de Graaff accelerator.
• a negative ion moves past point 1 on its way toward the main terminal.
• the ion collides with gas particles at point 2 (in the center of the main terminal).
• the ion continues to accelerate past point 3 (away from the main terminal).



8. What does the collision at point 2 do?
A. Strip the ion of a few protons.
B. Strip the ion of a few electrons.
C. Strip the ion of a few neutrons.
D. Add a few protons to the ion.
E. Add a few electrons to the ion.
F. Add a few neutrons to the ion.

9. What's true about the Leyden jar? (Select all that are correct.)
A. It's named after an eighteenth-century physicist.
B. Its inside and outside surfaces are made of metal.
C. Its inside surface is grounded.
D. Its outside surface is grounded.

10. Suppose you wanted to get your hair styled by Professor Goodstein and his Van de Graaff machine. How much would it cost?

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1. The discovery that electric charge is responsible for electric force was made by

A. The Ancient Greeks **B. Charles Coulomb** **C. Michael Faraday**
D. Benjamin Franklin **E. Robert Van de Graaff** **F. Joseph Leyden**

2. Which is true?

A. To understand electricity, one must understand matter.
B. To understand matter, one must understand electricity.
C. Both of these.
D. None of these.

3. When the proton/electron "balancing act" isn't perfect, the atom is called a/n

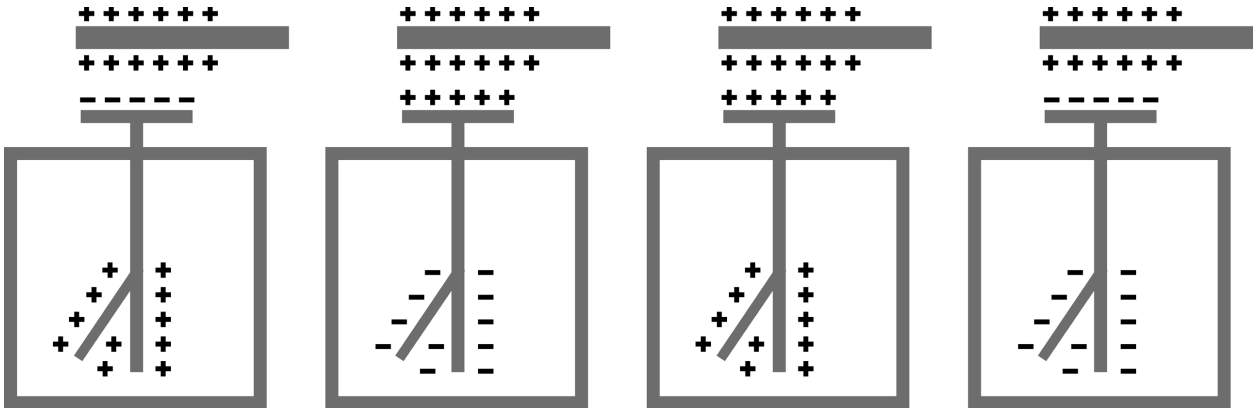
4. On a metal, an electric charge _____ out

_____ .

5. Every metal is like a giant _____.

6. Which diagram correctly depicts a charged rod held near the top of a gold leaf electroscope. (Red is positive and blue is negative.)

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



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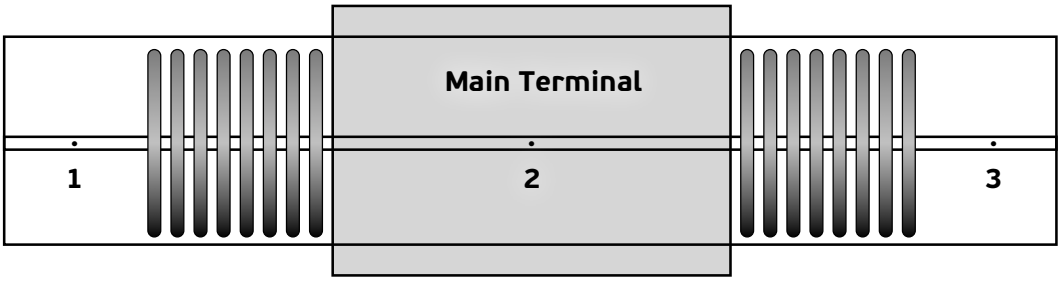

7. What is the charge on the main terminal?

8. What is the charge on the ion at point 3?

9. What's true about the Leyden jar? (Select all that are correct.)
A. Its inside surface is grounded.
B. Its outside surface is grounded.
C. It's named after an eighteenth-century physicist.
D. Its inside and outside surfaces are made of metal.

10. What's the price of a wild Van de Graaff doo styled by Professor Goodstein himself?