

*Consider the questions in the quiz, bearing in mind how you may have revised your model as a result of this extension activity.*

## Quiz Question 1

Given what you have learned in this extension, which of the following would be the most appropriate assumption to make in a model that uses charged entities to explain static electric effects?

- A. Positively (+) charged entities can move through materials and be transferred to other objects, but negatively (–) charged entities cannot move.
- B. Negatively (–) charged entities can move through materials and be transferred to other objects, but positively (+) charged entities cannot move.
- C. Both negatively (–) and positively (+) charged entities can move through materials and be transferred to other objects.

**Feedback:** Choice B is correct. Recall that negative charges represent electrons, and positive charges represent protons. Electrons, which orbit the atomic nucleus, are much easier to remove from an atom than protons, which are embedded in the nucleus. Thus electrons can move more easily through materials and be transferred to other objects than protons.

## Quiz Question 2

Suppose you had a positively (+) charged object that you wanted to make uncharged. Which would be the easiest way to do so?

- A. Remove some protons from it.
- B. Add some electrons to it.
- C. Both A and B would be equally easy.

**Feedback:** Choice B is correct.

## Quiz Question 3

According to the reasoning you applied in the second part of this assignment, when the Styrofoam plate and acrylic sheet have been rubbed together, how does the acrylic sheet acquire a positive charge?

- A. The Styrofoam plate transfers positive (+) charges to the acrylic sheet.
- B. Positive (+) charges are created on the acrylic sheet.
- C. Negative (−) charges are destroyed on the acrylic sheet.
- D. The acrylic sheet transfers negative (−) charges to the Styrofoam plate.
- E. Some combination of A, B, C, and D occurs.

**Feedback:** Choice D is correct.

## Quiz Question 1

Which of the following is most appropriate to describe what happens when a person discharges a negatively (–) charged object by touching it?

- A. Positive charges pass from the person to the object.
- B. Negative charges pass from the person to the object.
- C. Positive charges pass from the object to the person.
- D. Negative charges pass from the object to the person.

**Feedback:** Choice D is correct.

## Quiz Question 2

Which of the following is most appropriate to describe what happens when a person discharges a positively (+) charged object by touching it?

- A. Positive charges pass from the person to the object.
- B. Negative charges pass from the person to the object.
- C. Positive charges pass from the object to the person.
- D. Negative charges pass from the object to the person.

**Feedback:** Choice B is correct.

## Quiz Question 3

You have likely experienced a static ‘shock’ after walking across a carpet, just as John Travoltage did in the simulator. Which of the following best explains why this is much more likely to happen on a cold, dry, winter’s day than a warm, humid, summer’s day?

- A. Humid air does not undergo ‘breakdown’ so the charges do not transfer to the doorknob until you touch it.
- B. Negative charges are transferred to you from the carpet on a cold day, but not on a warm day.
- C. Negative charges are transferred to you from the carpet on both warm and cold days, but these excess negative charges do not remain on you. Instead, they are removed almost immediately by humid air.

**Feedback:** Choice C is correct. It may seem counterintuitive that dry conditions are more likely to produce “static shock”, while humid conditions (like you get during a thunderstorm) are more likely to produce lightning. In humid conditions, though, the humid air acts like a conductor all the time, so it is “discharging” you constantly. In a lightning storm, on the other hand, the clouds are so far from the ground that they actually need to be able to conduct through the humid air to be able to discharge to the ground. Note that not all lightning necessarily reaches the ground. There is quite a bit lightning activity *between* storm clouds and occasionally *within* storm clouds.