

## Answers to selected questions

### Chapter 12

- Q6** The leaves move closer together. This is because the rod has acquired opposite charges from the rubbing process. The leaves acquired the same charge as the rod had and therefore, opposite the charge of the fur.
- Q12** No. The separated charges will return to their undisturbed positions. There will not be any nearby charge imbalance to hold them in separation.
- Q18** Yes. The repulsive force between two charges produces a torque about the thin wire that supports the beam causing the wire to twist. The twisting of the wire develops an elastic restoring torque that returns the beam to its original position when one charge is removed.
- Q24** Yes. All that is required is that there exists a charge somewhere in the space so that it can exert a force on a positive test charge brought to a given point.
- Q30** The potential energy of the negative charge increases. The force on the charge will be opposite the direction to the field, so moving the charge in the direction of the field requires positive work against the field.
- Q36.** The leader ionizes some of the atoms along the path. These charged atoms enhance the air's ability to conduct along the path blazed by the leader and a much greater flow of charge can then proceed.