

Chapter 9 Review Chart

- Students should review the Key Ideas. Ask students to make each bullet into a True/False statement quiz. Then have students exchange quizzes.
- Have students build an idea web out of the Key Ideas. The bullets could be represented by drawings or by words.
- Have students use *BLM 0.0-10 Chapter Key Ideas* to review the key ideas in the chapter.
- Have students review their *Chapter 9 Study Guide Outline* notes to recall what they have learned in this chapter.
- Have students complete the *Chapter 9 Quiz* in the Student Workbook to review the vocabulary and concepts in this chapter.
- Encourage students to visit the online quiz centre on the Nelson Science website and complete the *Chapter 9 Self Quiz*.

Time

40–60 min

Skills and Processes

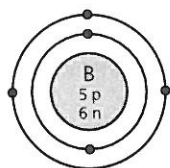
The Chapter Review provides an opportunity for students to demonstrate their understanding of and their ability to apply the key ideas, vocabulary, and skills and processes.

Program Resources

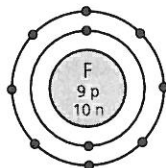
BLM 0.0-10 Chapter Key Ideas
Chapter 9 Quiz
Nelson Science Probe 9 website
www.science.nelson.com

Review Key Ideas and Vocabulary—Suggested Answers

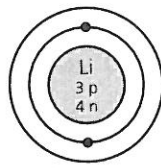
1. The diagrams below show (a) a neutral atom of boron (equal numbers of protons and electrons), (b) an atom of fluorine, which has gained one electron to become a negative ion of fluorine, and (c) an atom of lithium, which has lost an electron to become a positive ion of lithium.



(a)



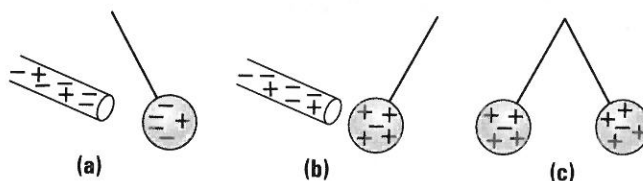
(b)



(c)

2. Since glass is below vinyl in the electrostatic series, the glass rod will acquire a positive charge.
3. The change in mass is not significant when an object gains or loses electrons. This is because the mass of an electron is very tiny.
4. (b)
5. (a)
6. (a) The diagram shows a negatively charged pith ball being repelled from a negatively charged rod.
(b) The diagram shows a positively charged pith ball being attracted to a negatively charged rod.

- (c) The diagram shows two positively charged pith balls suspended from a common point. The pith balls repel each other because they have the same charge.



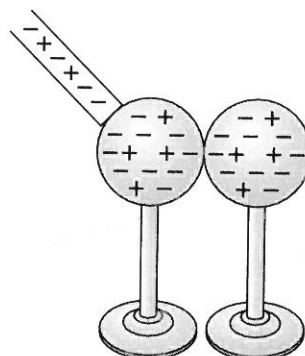
7. The socks and the shirt must be made of different materials. As a result of friction during the tumbling in the dryer, they acquired opposite charges and were attracted to each other.

8.

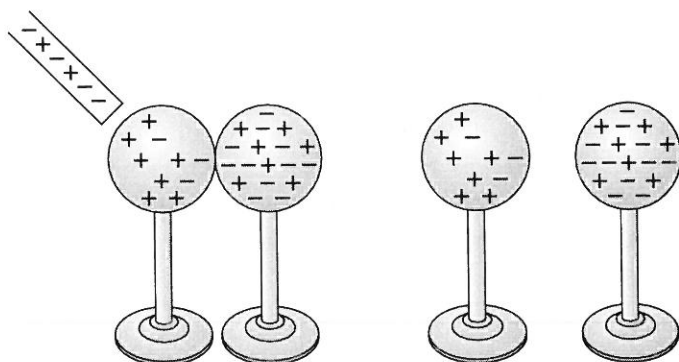
Term	Description
acetate	(b) a type of clear plastic
charging by friction	(c) a process in which an electric charge is transferred when objects rub together
charging by induction	
conductor	(d) a material that allows electrons to flow
coulomb	(h) an amount of electrical charge
electric force	(f) a push or pull between two electrically charged objects
grounded	(i) a process in which an object is connected to a large neutral object
insulator	(g) a material in which electrons are tightly bound to atoms or molecules
static charge	(a) a charge that stays put for some time
Van de Graaff generator	(e) a machine that produces static charges

Use What You've Learned—Suggested Answers

9. An electron is negative and a neutron is neutral (no charge). A charged object is attracted to a neutral object. However, since the neutron has no charge, it cannot be attracted to any charged object.
10. The diagram below shows two spheres being charged by conduction. Both spheres become negatively charged.



The following diagrams show two spheres being charged by induction. The two spheres become oppositely charged. The spheres need to be separated before the negatively charged rod is removed.



11. Crouching makes you a smaller target for the lightning and reduces your chances of being struck. You should crouch on the balls of the feet with your feet together. In addition, you should cover your ears to protect them from the noise. The reason you should not lie down is that if lightning strikes nearby, the charge will radiate out. Since you are a better conductor than the ground underneath you, the charge will go through you.
12. The paint is given a static charge either by passing it through a strong electric field or by contact with a charged rotating disc. The electrostatic paint is then attracted to a grounded car. The advantage is that very little paint is lost. However, one disadvantage is that the paint coverage may not be uniform, which is particularly true of hollows in the surface.
13. When the cellophane tape is pulled from the roll, the contact between the adhesive surface and the cellophane is broken. This is similar to friction, and static charge is transferred. Since the tape now has a charge on it, there is electrostatic attraction for the oppositely charged side of the tape, and the tape gets tangled.
14. The spark from a Van de Graaff generator would be longer in winter. Since dry air is a good insulator, a larger charge would build up on the Van de Graaff generator dome in winter when the air is dry. The larger charge would be able to produce a longer spark.
15. St. Elmo's fire is a phenomenon that occurs on pointed objects. It is known as a corona. Static charges build up on points and, when the charge becomes large enough, the air around the object is ionized and the charge on the object leaks into the air. The ionized air emits light called St. Elmo's fire.

Think Critically—Suggested Answers

16. Birds do not get shocked when flying near high voltage lines because the air surrounding the wire is a sufficient insulator.

17. Laser light is electromagnetic radiation, which has no charge. Laser light has enough energy to reverse the charge on the area of the drum it strikes. A laser light is used because it can be aimed accurately.
18. The Wimshurst machine has two counter-rotating plastic plates that have small metal plates attached to them. When the plates are rotated, brushes rub against the plates and the friction produces static charges. The charges are stored in Leyden jars that accumulate the charge. When the charge is large enough, a spark jumps between the balls on the end of metal rods that are connected to the Leyden jars.
19. Although planes are grounded before refuelling to prevent sparks from igniting fires, there seems to be no basis for the use of ground straps to prevent motion sickness in cars.

Reflect On Your Learning—Suggested Answers

20. Answers will vary. Some students may have discovered that they had no real understanding of thunderstorms and can now appreciate them more.

Meeting Individual Needs

ESL

- It might be helpful for some students to make a vocabulary list and define the words using pictures and diagrams.

Extra Support

- Encourage students to review the Key Ideas by asking them to provide an example that illustrates each idea. This could be done as a class or to help weaker students organize their ideas.

Extra Challenge

- Challenge students to devise an experiment for Review question 13 to determine which side of the cellophane tape is negatively charged.