

# Chapter 11

## Engage: Gifts from Your Parents

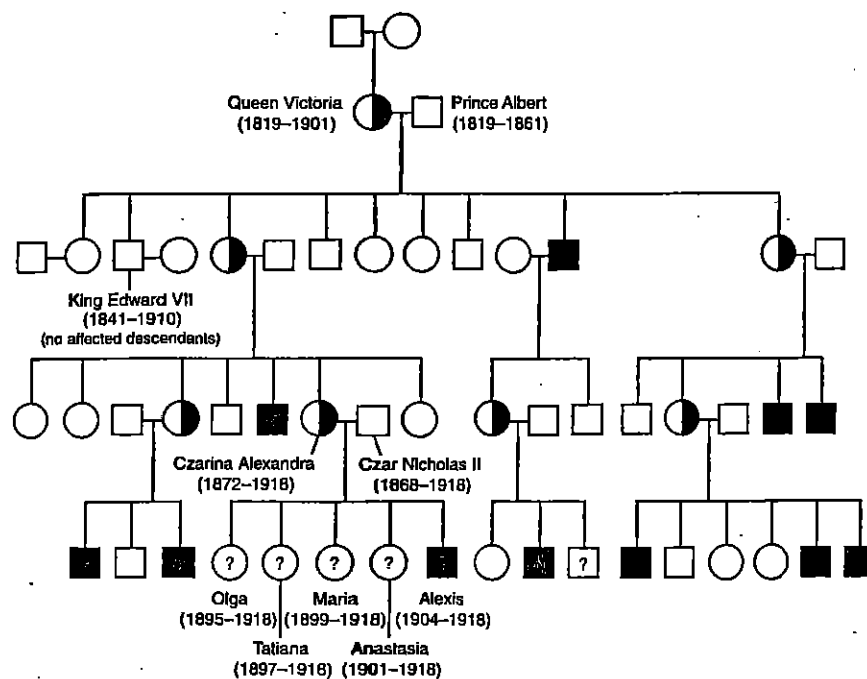
“You have your mother’s nose.” “You smile just like your grandfather.” “You’ll be as handsome as your uncle.” Comments such as those often are heard when families get together. They remind us of the biological link from one generation to the next. The processes of reproduction ensure that species can survive through many generations. Exactly what is it that survives? It is not the organism itself. Because, regardless of species, all organisms eventually die. Yet, the survival of a species or a family line shows that something is handed down from parents to offspring.

Throughout this chapter, you will investigate the mechanisms of inheritance that underlie reproduction. As you work, consider what biological mechanisms exist that allow families to continue and species to survive even though individuals die.

In this activity, you will study how genetic information transfers from one generation to the next. Specifically, you will examine the biological inheritance of one trait in the family of the last czar of Russia.

### Procedures

1. Read *A Royal Tragedy* (p. 418-420).
2. Discuss the following questions as a class and write your responses on the back of this paper.
  - a. How did the young czaravitch come to have hemophilia?
  - b. How is it possible that the mother and father showed no signs of the disease?
  - c. Suggest some traits that people acquire during their lifetime. What is the difference between an acquired trait and an inherited trait?
  - d. How might cultural practices have influenced the frequency of hemophilia occurring among the czar’s family?



□ normal male    ■ affected male    ○ normal female    ◐ carrier female

Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

**WHAT DO YOU KNOW ABOUT HUMAN GENETICS?**

The purpose of this survey is to find out what people really understand about human genetics. Read each statement and record whether you believe the statement to be true (T) or false (F). Record your own answers in column A. Find two other persons, preferably adults, to survey. Record their answers in the columns marked B and C.

	A	B	C	
1.				1. If two parents have brown eyes, then all of their children will have brown eyes.
2.				2. Some people are born with inherited disorders.
3.				3. A man's sperm cells determine whether a child will be a boy or a girl.
4.				4. No one has ever seen a chromosome.
5.				5. Persons of the same sex can donate blood to others of the same sex even if the blood types are different.
6.				6. Each parent gives an equal number of chromosomes to his or her children.
7.				7. Only the father's traits show in a male child.
8.				8. Identical twins are always of the same sex.
9.				9. Fraternal twins are more closely related to each other than to other children in the family.
10.				10. Color blindness is more common in males than females.
11.				11. A parent can pass traits to a child even though the parent does not show the trait.
12.				12. All harmful traits are caused by recessive genes.
13.				13. Identical twins have more of the same genes than other children in the family.
14.				14. Some traits do not show in a person because the traits are recessive.
15.				15. None of the grandparents' traits are passed on to the grandchildren.

1. Did you and the people you surveyed have the same answers to the questions? Why do you think this is so?
2. What other traits of humans do you think are inherited?