Name _____ Class _____ Date _____

SECTION 3 The Endocrine System

BEFORE YOU READ

After you read this section, you should be able to answer these questions:

- Why is the endocrine system important?
- How do feedback systems work?
- What are common hormone imbalances?

National Science Education Standards
LS 1a, 1d, 1e

What Is the Endocrine System?

The **endocrine system** controls body functions using chemicals made by endocrine glands. A **gland** is a group of cells that makes special chemicals for your body. The chemicals made by endocrine glands are called hormones. A **hormone** is a chemical messenger. It is made in one cell or tissue and causes a change in another cell or tissue. Hormones flow through the bloodstream to all parts of the body. ☑

STUDY TIP

Describe As you read, fill in the chart at the end of the section to name the major endocrine glands and what each one does.

READING CHECK

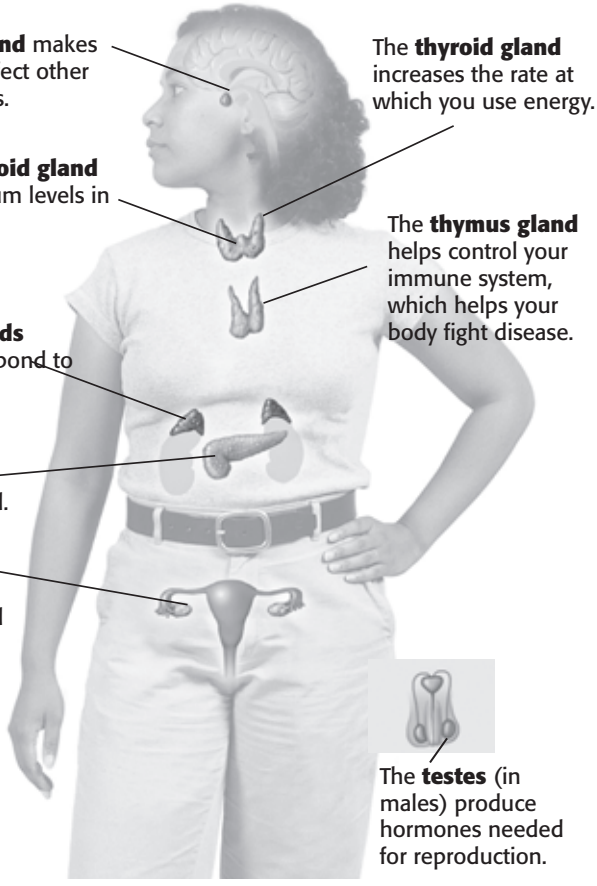
1. Explain How do hormones move from one part of the body to another?

_____

_____

_____

Glands and Organs of the Endocrine System



TAKE A LOOK

2. Identify What two structures produce hormones needed for reproduction?

_____

_____

3. Identify Which gland makes hormones that affect organs and other glands?

_____

Critical Thinking

4. Infer Why do you think increasing your breathing rate helps prepare you to fight or run away?

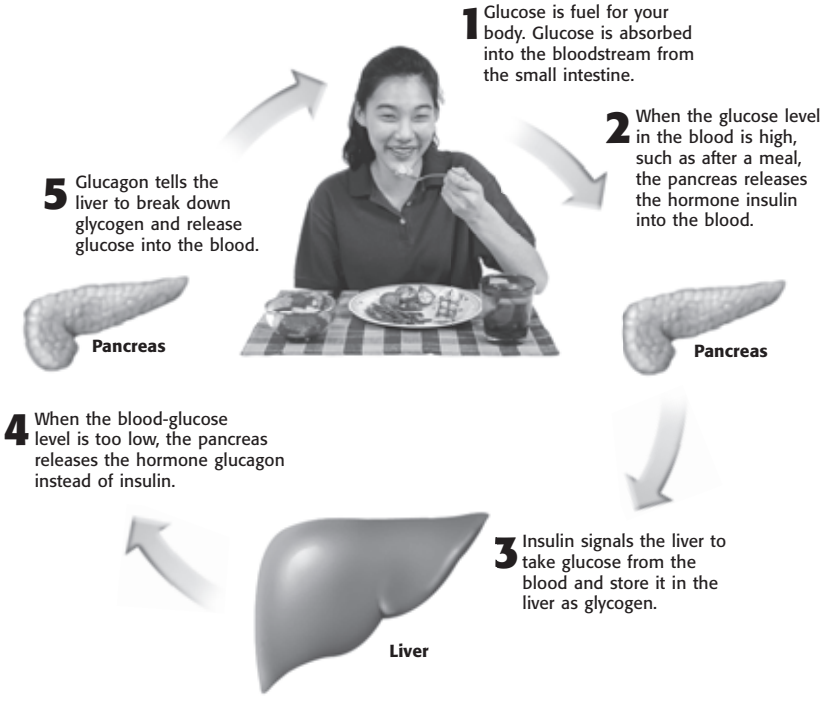
ADRENAL GLANDS

Endocrine glands may affect many organs at one time. For example, the adrenal glands release the hormone *epinephrine*, sometimes called *adrenaline*. Epinephrine increases your heartbeat and breathing rate. This response is called the fight-or-flight response. When you are scared, angry, or excited, the fight-or-flight response prepares you either to fight the danger or to run from it.

How Do Feedback Systems Work?

Recall how feedback mechanisms work in the nervous system. Feedback mechanisms are cycles in which information from one step controls another step in the cycle. In the endocrine system, endocrine glands control similar feedback mechanisms.

The pancreas has specialized cells that make two different hormones, *insulin* and *glucagon*. These two hormones control the level of glucose in the blood.



TAKE A LOOK

5. Explain How could you raise your blood-glucose level without involving hormones?

6. Identify Which hormone tells the liver to release glucose into the blood?

What Is a Hormone Imbalance?

Sometimes, an endocrine gland makes too much or not enough of a hormone. For example, a person's body may not make enough insulin or be able use it properly. This is a condition called *diabetes mellitus*. A person who has diabetes may need daily injections of insulin. These injections help keep his or her blood-glucose levels within safe limits. Some patients get their insulin automatically from a small machine worn on the body. ☑

This woman has diabetes. She is wearing a device that delivers insulin to her body.

READING CHECK

7. Define What is a hormone inbalance?

Another hormone imbalance is when a child's pituitary gland doesn't make enough growth hormone. As a result, the child does not grow as quickly or as much as he or she should. If the problem is found early in childhood, a doctor can prescribe growth hormone.

In some cases, the pituitary gland may make too much growth hormone. This may cause a child to grow taller than expected.

Endocrine gland	Function
Pituitary	
	increases the rate at which you use energy

TAKE A LOOK

8. Summarize Use this chart to help you summarize the major endocrine glands and their functions.

Name _____ Class _____ Date _____

Section 3 Review

NSES LS 1a, 1d, 1e

SECTION VOCABULARY

endocrine system a collection of glands and groups of cells that secrete hormones that regulate growth, development, and homeostasis; includes the pituitary, thyroid, parathyroid, and adrenal glands, the hypothalamus, the pineal body, and the gonads	**gland** a group of cells that make special chemicals for the body **hormone** a substance that is made in one cell or tissue and that causes a change in another cell or tissue in a different part of the body

1. **Explain** What is the function of the endocrine system?

2. **Compare** How are the thymus and thyroid gland similar? How are they different?

3. **Identify Relationships** How do the circulatory system and the endocrine system work together?

4. **Explain** What does insulin do?

5. **Apply Concepts** Many organs in the body are part of more than one organ system. List three examples from this section of organs that are part of both the endocrine system and another organ system.

6. **Infer** Glucose is a source of energy. Epinephrine quickly raises your blood-glucose level when you are excited or scared. Why is epinephrine important during these times?