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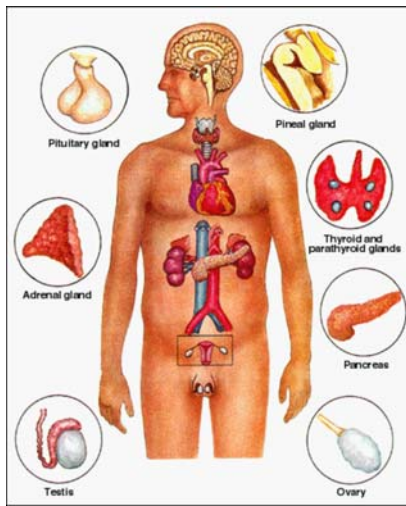
# THE ENDOCRINE SYSTEM: REGULATING THE BODY'S CHEMISTRY

RAINBOW EDUCATIONAL MEDIA, 2000

Grade Levels: 5-10

23 minutes

1 Instructional Graphic Enclosed



## DESCRIPTION

The endocrine system maintains the body's delicate chemical balance. Describes the location, function, and effects of the major endocrine glands, and notes their close relationship to the nervous system. Some discussion of diabetes and hormonal imbalances.

## ACADEMIC STANDARDS

### Subject Area: Science – Life Sciences

- ★ Standard: Understands the structure and function of cells and organisms
  - Benchmark: Knows that cells convert energy obtained from food to carry on the many functions needed to sustain life (e.g., cell growth and division, production of materials that the cell or organism needs) (See Instructional Goal #2.)
  - Benchmark: Knows that multicellular organisms have a variety of specialized cells, tissues, organs, and organ systems that perform specialized functions (e.g., digestion, respiration, reproduction, circulation, excretion, movement, control and coordination, protection from disease) (See Instructional Goals #1, 2, 3, and 4.)
  - Benchmark: Knows how an organism's ability to regulate its internal environment enables the organism to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment (See Instructional Goal #2, 4, and 5.)

## INSTRUCTIONAL GOALS

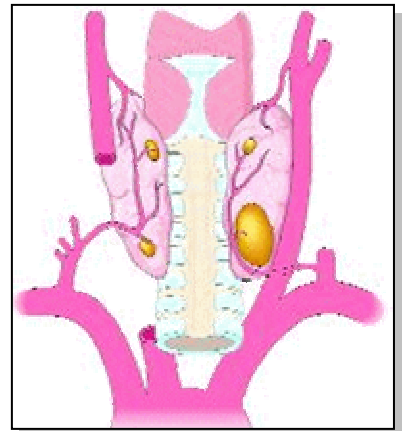
1. To describe the location and function of the major endocrine glands.
2. To explain the role of hormones in regulating metabolism, growth, and other body processes.
3. To explain how the nervous and endocrine systems interact.
4. To describe the role of the brain's hypothalamus in maintaining the right levels of hormones in the body.
5. To explain how diabetes is an example of the endocrine system failing to function correctly.

## VOCABULARY

1. adrenal glands
2. adrenalin
3. diabetes
4. endocrine gland
5. endocrine system
6. endocrinologist
7. epinephrine
8. estrogen
9. fight or flight response
10. glucose
11. growth hormone
12. hypothalamus
13. insulin
14. menopause
15. menstruation
16. nervous system
17. ovaries
18. oxytocin
19. pancreas
20. parathyroid gland
21. parathyroid hormone
22. pituitary
23. puberty
24. receptor
25. target cell
26. testes
27. testosterone
28. thymus
29. thyroid
30. thyroid stimulating hormone
31. thyroxin

## BEFORE SHOWING

1. Stimulate discussion on topics that will be covered in the video:
  - a. How do people grow?
  - b. How do boys and girls develop sexually into men and women?
  - c. How does the body react to stress?
  - d. What causes diabetes?
2. Discuss the differences between endocrine and exocrine glands.
3. Research to find the heights of the shortest and tallest humans on record.
  - a. Write this information in both English and metric units.
  - b. Discuss how these people's lives were affected by their height and what could be some possible causes for such abnormalities.



## DURING SHOWING

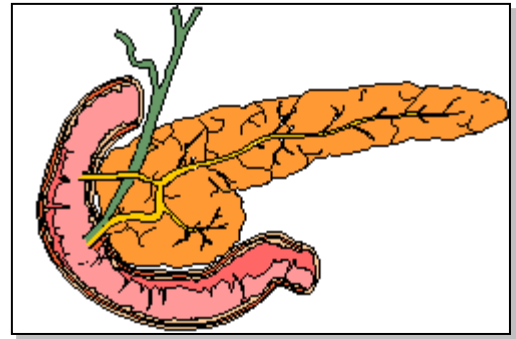
1. View the video more than once, with one showing uninterrupted.
2. Pause at the section showing the function of the parathyroid glands. Discuss what would happen if the parathyroid gland did not function properly.
3. Pause at the section on the fight or flight response. List other situations where the release of epinephrine helps prepare the body for strenuous activity.

## AFTER SHOWING

### ► Discussion Items and Questions

1. What are the two main body systems that regulate the activities of the body?
2. What makes up the endocrine system?
3. What are hormones? How do hormones function?
4. What hormone do the parathyroid glands secrete and what does this hormone do?

5. What is the fight or flight response?
6. What happens to hormones after they have completed their job?
7. How does the thyroid gland help maintain a fairly constant internal temperature?
8. How is the hypothalamus like a thermostat?
9. How is the pituitary gland like the conductor of an orchestra?
10. What are some of the changes that occur during puberty?
11. What is the role of the pancreas?
12. What is diabetes?



► **Applications and Activities**

1. Draw an outline of the human body. Use pieces of clay to represent the glands of the endocrine system and place them in the correct location. Label them with "flags".
2. Complete a worksheet on the major endocrine glands and their hormones. (See Instructional Graphic.)
3. Research and report on the following topics:
  - a. protein hormones and steroid hormones
  - b. the hormones produced by the anterior and posterior parts of the pituitary gland
  - c. the role of glucagon in regulating glucose levels
  - d. homeostasis
  - e. pineal gland
4. Investigate diseases of the endocrine glands. Report on the cause of the disease, its symptoms, and the current method of treating it.
  - a. Addison's disease
  - b. Cushing's syndrome
  - c. acromegaly
  - d. dwarfism
  - e. gigantism
  - f. hyperthyroidism
  - g. hypothyroidism
5. Design a poster that compares how a thermostat controls the heat in a house and how the hypothalamus monitors the temperature inside the body.
6. Invite a person who has diabetes to speak on coping with the disease.
7. Research glucose levels of a diabetic before and after meals. Represent this data on a graph and compare it with a non-diabetic's levels. Report on a diet that is suitable for diabetics.
8. Report on the medical use of epinephrine in cases of cardiac arrest.
9. Develop a chart or diagram that shows the changes the body goes through during these stages of life and note which endocrine glands play a role in these changes:
  - a. infancy to childhood
  - b. puberty
  - c. pregnancy and childbirth
  - d. midlife changes such as menopause
10. Display works of art that depict depression. Report on research that shows the effects of hormones on depression.

## RELATED RESOURCES



- [Glands and Hormones #3470](#)



### World Wide Web

The following Web sites complement the contents of this guide; they were selected by professionals who have experience in teaching deaf and hard of hearing students. Every effort was made to select accurate, educationally relevant, and "kid safe" sites. However, teachers should preview them before use. The U.S. Department of Education, the National Association of the Deaf, and the Captioned Media Program do not endorse the sites and are not responsible for their content.

- **ENDOCRINE DISORDERS AND ENDOCRINE SURGERY**



<http://www.endocrineweb.com/>

Includes information on endocrine disease, conditions, hormone problems, and treatment options.

- **BRAINPOP**

<http://www.brainpop.com/health/>

Contains animated quizzes and movies on homeostasis, puberty, hormones, and the endocrine system.



- **THE HORMONE FOUNDATION**

[http://www.hormone.org/publications/what\\_is\\_endocr.html](http://www.hormone.org/publications/what_is_endocr.html)

Includes information on the endocrine system, the duties of an endocrinologist, and some diseases and disorders of the endocrine system.



## INNER LEARNING ONLINE

- **INNER LEARNING ONLINE**

<http://www.innerbody.com/htm/body.html>



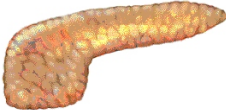

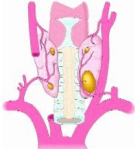


Locate and chooses the Endocrine system by scrolling to the right in the left window and clicking on the correct graphic which will then show the location of the endocrine glands. Clicking on a gland will link to text that explains the function and importance of the gland.

### INSTRUCTIONAL GRAPHICS

- MAJOR ENDOCRINE GLANDS AND THEIR HORMONES

## Major Endocrine Glands and Their Hormones

**Directions:** Complete the following table by writing the correct answers from the list below.

Gland(s)	Hormone(s)	Function of Hormone(s)
 <p><b>Adrenal</b></p>		
 <p><b>Ovaries</b></p>		
 <p><b>Pancreas</b></p>		
 <p><b>Pituitary</b></p>		
 <p><b>Parathyroids</b></p>		
 <p><b>Testes</b></p>		
 <p><b>Thyroid</b></p>		

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• testosterone</li> <li>• promotes milk production</li> <li>• insulin</li> <li>• stimulates growth</li> <li>• regulates metabolism and growth</li> <li>• estrogen</li> <li>• thyroxin</li> <li>• produces female secondary sex characteristics</li> <li>• regulates calcium use by body</li> <li>• prolactin</li> <li>• oxytocin</li> </ul> | <ul style="list-style-type: none"> <li>• epinephrine</li> <li>• stimulates release of milk</li> <li>• parathyroid hormone</li> <li>• TSH (thyroid stimulating hormone)</li> <li>• norepinephrine</li> <li>• growth hormone</li> <li>• stimulates thyroid to release thyroxin</li> <li>• produces male secondary sex characteristics</li> <li>• increases heart rate and blood pressure</li> <li>• directs blood to muscles and brain</li> </ul> |
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