

Hormones are involved in more than the reproductive system.

Use **pages 640-645** in the Life Science textbook to answer the following questions.

1. How does the nervous system (the brain) regulate the body's activities? (½ point)
2. How does the endocrine system regulate the body's activities? (½ point)
3. What is an endocrine gland? (½ point)
4. What is a hormone? (½ point)
5. What four effects can a hormone have on another body part? (1 point)
6. How does a hormone travel? (½ point)
7. What is one way an endocrine gland is "told" to release a hormone? (½ point)
8. What are target cells (and target organs)? (½ point)
9. What is the hypothalamus? What does it do? (1 point)
10. What are the two ways the hypothalamus causes the pituitary gland to release hormones? (1 point)
11. Negative feedback is very important in hormone regulation. Describe negative feedback **in your own words**. (1 point)
12. The production of thyroxine involves negative feedback. What happens when the amount of thyroxine is just right? (Your answer should include the following terms: hypothalamus, pituitary gland, TSH, thyroid gland, and thyroxin.) (1 point)
13. What happens when the amount of thyroxine becomes too low? (Your answer should include the following terms: hypothalamus, pituitary gland, TSH, thyroid gland, and thyroxin.) (1 point)

14. Another negative feedback system with hormones involves homeostasis of sugar in the blood. Two hormones are involved with maintaining blood sugar levels: **insulin** and **glucagon**. Both of these hormones are produced by special cells in the pancreas. Read the following carefully.

Insulin causes the cells in the body to absorb sugar from the blood. It also directs the liver to take in extra sugar and store it in large molecules called glycogen. (Glycogen is a long chain of sugar molecules similar to starch.)

Glucagon affects blood sugar levels by causing the liver to break down the glycogen and release the stored sugar into the blood.

Below are two situations. For each situation cover the following:

- what is happening with the level of sugar (glucose) in the blood,
 - how the pancreas will react to this situation, and
 - how the pancreas will know when to stop producing the hormone that it has been producing.
- This is the negative feedback part of the system.

This will take some thinking.

You have just finished a birthday celebration and are full of candy, soft drinks, cake, and ice cream. (1 ½ points)

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You have been hiking all day and haven't stopped to have a decent lunch. You are hungry and are feeling low in energy. (1 ½ points)

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15. The hormones of the endocrine system affect all the organ systems of our body. For each of the following systems, find an endocrine gland that affects it. **Name the endocrine gland, the hormone,** and **describe the affect** the hormone has on the system. Use Figure 2 on page 643 if you are doing this for homework. If you are in the classroom use the chart on hormones on the separate piece of paper. (½ point each)

- Circulatory
- Respiratory
- Digestive
- Excretory
- Skeletal
- Muscles

This is only a sample of the hormones in our bodies. There are at least **48** different hormones!

None of the hormones released by the hypothalamus are listed. There are many!!

Endocrine Gland	Hormone	Function
Pituitary	Growth Hormone	Stimulates skeleton growth
	FSH and LH	Stimulated development of male and female sex organs
	Prolactin	Stimulates production of milk in mammary glands
	Adrenocorticotrophic hormone (ACTH)	Aids functioning of the adrenal glands
	Thyroid Stimulating hormone (TSH)	Causes thyroid to produce thyroxin
	Vasopressin (Antidiuretic hormone)	Causes kidneys to retain more water
	Oxytocin	stimulates birth process as it causes smooth muscles in the uterus to contract
Parathyroid	Parathyroid hormone	Regulates the level of calcium and phosphorus in the blood
Thyroid	Thyroxine	Increases rate of cellular respiration
	Calcitonin	Maintains correct level of calcium and phosphorus in the blood; helps with bone construction
Thymus	Thymosin	Regulates development and function of the immune system
Adrenal	Adrenaline	Increase heart rate; raises blood sugar; increases breathing rate; dilate pupils; decrease digestive activity
Pancreas	Insulin	Decreases blood sugar level by causing cells to absorb sugar and liver to store excess sugar as glycogen
	Glucagon	Increases blood sugar level by causing liver to release stored sugar
Ovaries	Estrogen	Produces female secondary sex characteristics
	Progesterone	Promotes growth of lining of uterus
Testes	Testosterone	Produces male secondary sex characteristics