

# Warm-Up

## The Nervous and Endocrine Systems



### Lesson Question



### Lesson Goals

**Identify** the major structures and functions of the nervous system.

**Analyze** how sensory

communicate with the brain in response to stimuli.

**Examine** the major structures and functions of the endocrine system.

**Analyze** how feedback loops work in the endocrine system.



### Words to Know

Fill in this table as you work through the lesson. You may also use the glossary to help you.

axon	the part of the neuron that carries <input type="text"/> away from the cell body to other neurons, muscles, or glands
central nervous system	the part of the nervous system that includes the <input type="text"/> and the spinal cord
dendrite	the part of the neuron that <input type="text"/> information from other neurons, muscles, or glands
gland	a structure that produces substances that the <input type="text"/> uses
neuron	a specialized cell that generates and conducts <input type="text"/> impulses throughout the body

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2K

## Words to Know

peripheral nervous system	the part of the nervous system <input type="text"/> the brain and spinal cord
interneuron	a nerve cell that carries information between a sensory <input type="text"/> and a motor neuron
metabolism	the processes by which an organism uses food and water to <input type="text"/> , produce energy, and repair cells
motor neuron	a nerve cell that <input type="text"/> information from the brain or spinal cord to muscles and glands
receptor	a structure on a cell that receives signals from <input type="text"/> the cell
reflex	an involuntary, automatic response to a <input type="text"/>
sensory neuron	a nerve cell that carries information from the sense organs to the spinal cord and the <input type="text"/>
hormone	a substance produced by the endocrine system that is <input type="text"/> into the bloodstream
hypothalamus	the part of the brain that helps the body <input type="text"/> homeostasis
negative feedback	a type of feedback in which the <input type="text"/> of a system is reduced

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W  
2K**Words to Know**

ovaries	a pair of organs in the <input type="text"/> abdomen that produces eggs and hormones
pituitary gland	a gland in the brain that <input type="text"/> other glands in the body
positive feedback	a type of feedback in which a system is triggered to <input type="text"/> an output
testes	a pair of <input type="text"/> reproductive organs that produce sperm and hormones

**Stimuli and Responses**

- A living thing responds to stimuli.
- A  is anything that can cause an organism to respond or react.
  - Example of a stimulus – bright light in the eyes
- A response is a  to a stimulus.
  - Example of a response – closing the eyes to avoid exposure to bright light

## Instruction

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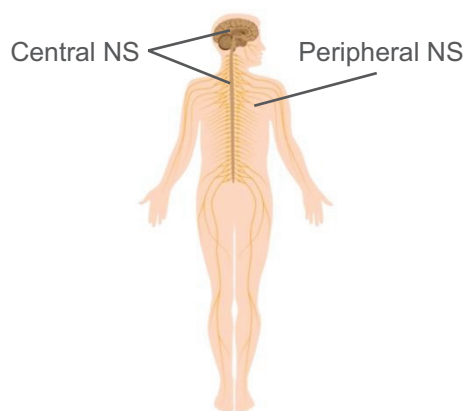
**The Main Function of the Nervous System**

- The nervous system allows the body to respond to  inside and outside the body.
  - If the body needs water, the part of the brain that senses thirst is activated.
  - If the body senses an object coming toward it, it activates  to move the body out of harm's way.

**Two Parts of the Nervous System**

- The  **nervous system** (CNS) is the part of the nervous system that includes the brain and the spinal cord.
- The **peripheral nervous system** (PNS) is the part of the nervous system outside the brain and spinal cord.

*Draw an arrow to show the part of the nervous system that lies outside the brain and spinal cord.*



## Instruction

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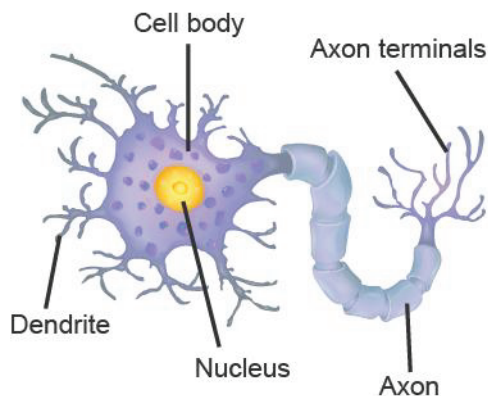
**Neurons**

- A **neuron**, or a  cell, is a specialized cell that generates and conducts  impulses throughout the body.
- Neurons carry  from one part of the body to another.

**Parts of a Neuron**

- A  is the part of the neuron that receives information from other neurons, muscles, or **glands**.
- A  is a structure that produces substances that the body uses.
- The  carries information away from the cell body.
  - Axon terminals carry information to other neurons, muscles, or glands.

*Circle the part of a neuron that carries information to the other neurons.*



## Instruction

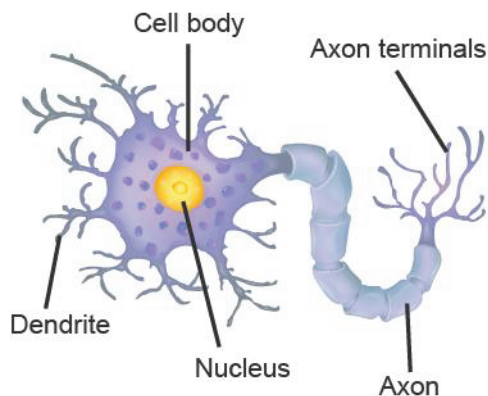
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**Flow of Information through a Neuron**

- Information enters the neuron through the .
- Information passes through the cell body to the axon and the axon terminals.
- Information leaves the neuron through the axon .
- Information is passed on to a neuron, muscle, or gland.



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**Stimuli Receivers**

- The five sense organs have  that receive stimuli from the environment and pass on this information to neurons.
  - The  receives light stimuli.
  - The  receives taste stimuli.
  - The skin receives , pain, and pressure stimuli.
  - The nose receives smell stimuli.
  - The ear receives sound stimuli.

# Instruction

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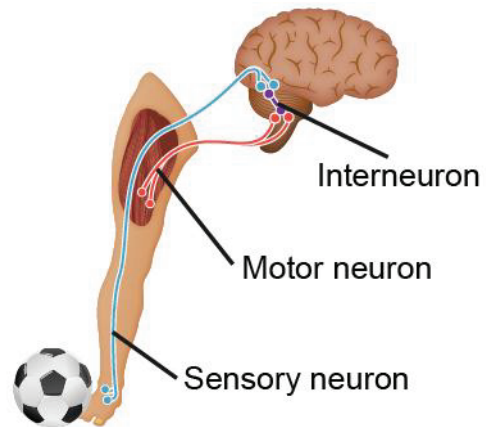
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### Types of Neurons

- A  **neuron** carries information from sense organs to the spinal cord and the brain.
- An  carries information between a sensory neuron and a motor neuron.
- A **motor neuron** carries information from the  or spinal cord to  and glands.

*Circle the part that allows the body to react to a stimulus through muscle movement.*

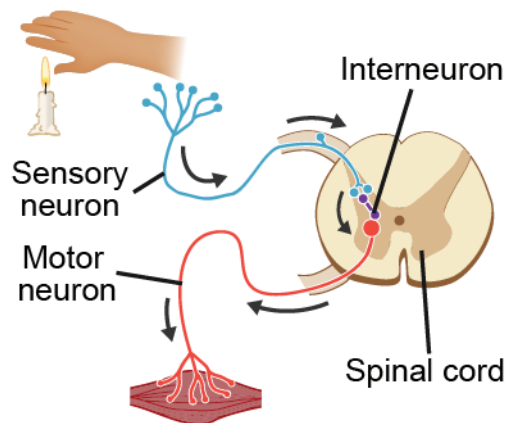


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### Reflex Response

- A **reflex** is an , automatic response to a .
- Touching a  object causes a reflex.

*Draw an arrow to indicate the point from which the interneuron carries information to the motor neuron.*



## Instruction

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**From Stimuli to Behavior or Memory**

- The information from stimuli is processed by the brain and can:
  - result in a .
  - create a .

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**Function of the Endocrine System**

- The endocrine system keeps the body healthy by producing  that control how cells or organs function.
  - A hormone is a substance produced by the endocrine system that is  into the bloodstream.
  - Hormones travel to cells and organs where they are used to maintain homeostasis.



# Instruction

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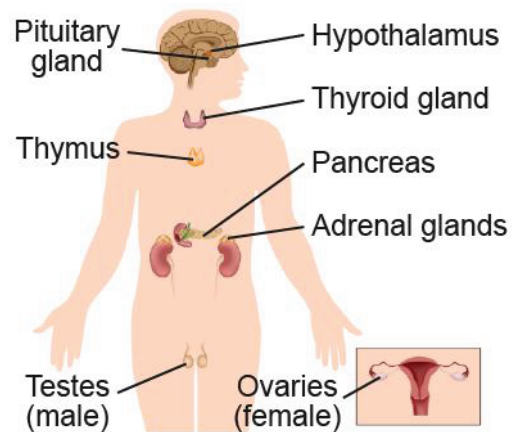
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### Glands of the Endocrine System

- The  is the part of the brain that helps regulate the endocrine system.
- The  **gland** regulates growth, water balance, and blood pressure.
  - The pituitary gland is  by the hypothalamus.

*Circle the structure that is the messenger between the brain and other endocrine glands.*



- The thyroid controls .
- The  helps children develop strong immune systems.

## Instruction

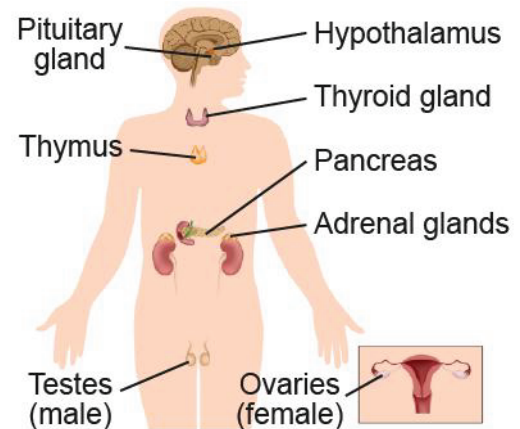
## The Nervous and Endocrine Systems

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**Glands of the Endocrine System**

- The  helps control the amount of sugar in the blood.
- glands help the body respond to emergency events.



- The  are a pair of male reproductive organs that produce sperm and hormones.
- Secondary sex characteristics in males include:
  - additional growth of hair on some parts of the body.
  - deepening of the voice.
  - broadening of the shoulders.

- The  are a pair of organs in the female abdomen that produces eggs and hormones.
- Secondary sex characteristics in females include:
  - additional growth of hair on some parts of the body.
  - development of breasts.

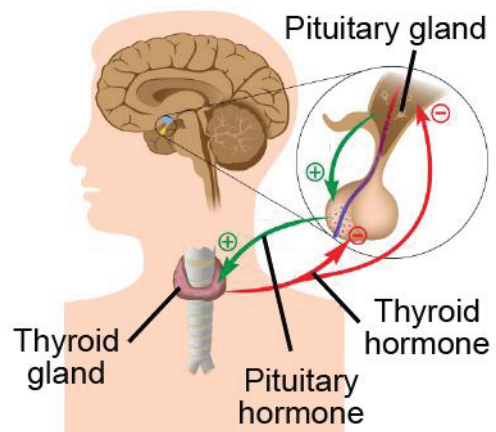
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**Positive Feedback**

- **Positive feedback** is a type of feedback in which a system is triggered to produce an .
- Positive feedback triggers the  to stimulate the thyroid gland to help regulate .

**Negative Feedback**

- **Negative feedback** is a type of feedback in which the output of a system is .
- Negative feedback stops the production of hormones produced by the pituitary and  glands.

## Summary

## The Nervous and Endocrine Systems

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## Lesson Question

How does the body respond to stimuli?

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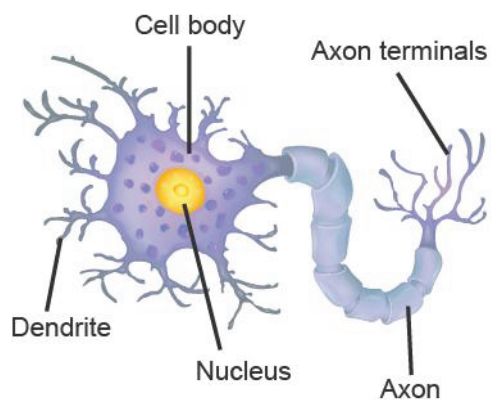
## Answer

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## Review: Key Concepts

- The function of the  system is to help the body respond to stimuli.
- The neuron is the basic unit of structure and  of the nervous system.



# Summary

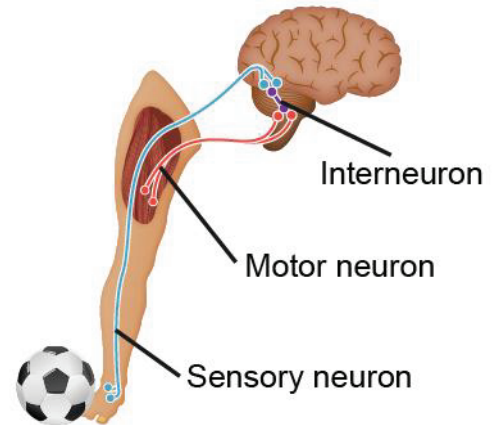
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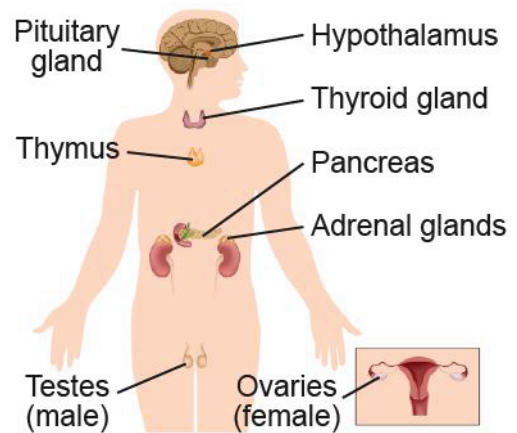
### Review: Key Concepts

- Sensory , interneurons, and motor neurons work together to respond to stimuli.
  - Sensory neurons bring information to the brain.
  - carry information between a sensory neuron and a motor neuron.
  - A motor neuron stimulates muscle cells.



### Review: Key Concepts

- The function of the endocrine system is to produce hormones that keep the body healthy.
- The main structures of the endocrine systems are the  in the brain and various glands throughout the body.
- Positive and negative feedback loops are needed to maintain homeostasis.





# Summary

## The Nervous and Endocrine Systems

*Use this space to write any questions or thoughts about this lesson.*

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