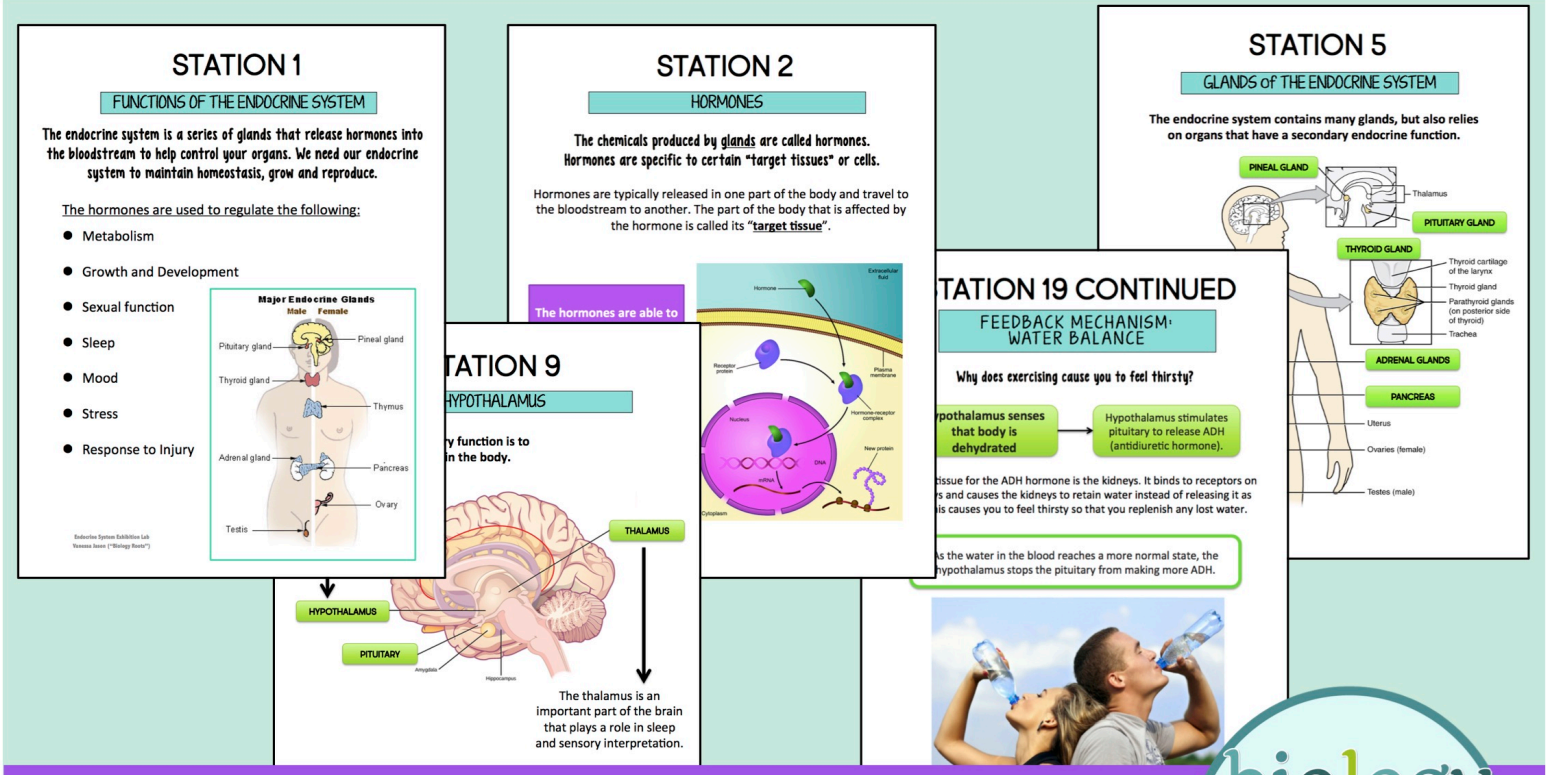
endocrine system

Exhibition Stations



STATIONS WITH STUDENT ANSWER SHEET INCLUDED

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27 Stations with student answer sheet included.
Covers all things endocrine system with plenty of examples.
Also includes editable version and shortened version.

Recommended for grades 9 and up.

STATION 1

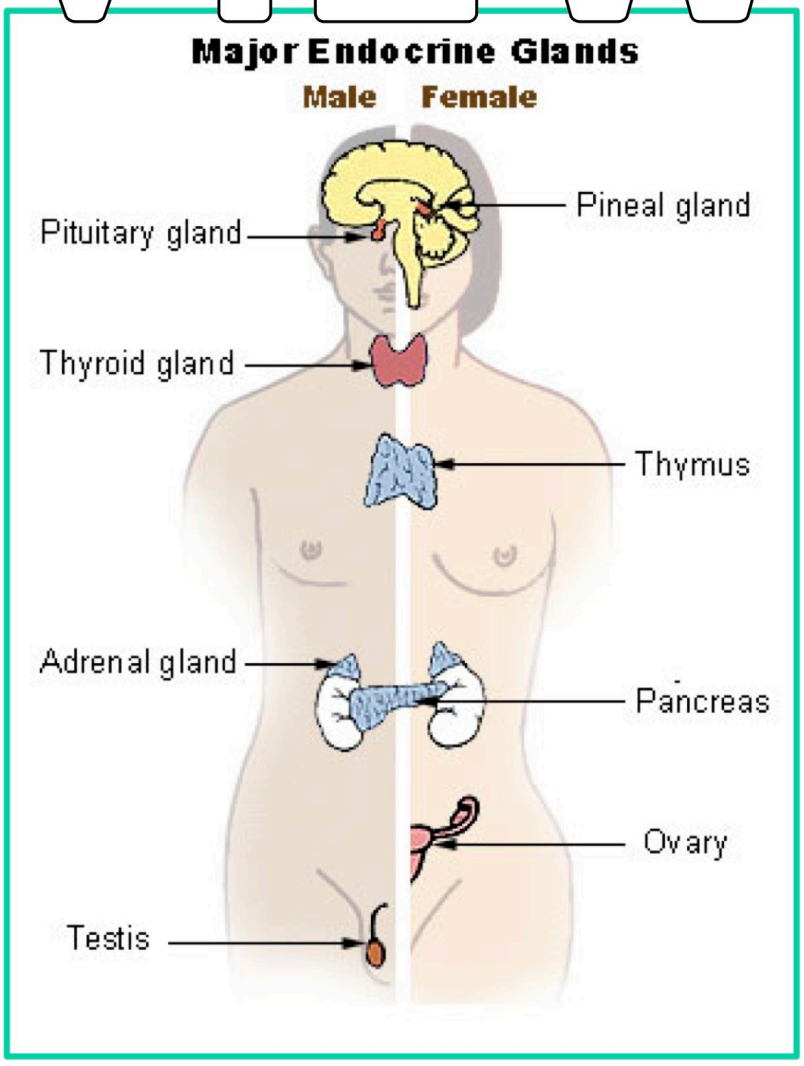
FUNCTIONS OF THE ENDOCRINE SYSTEM

The endocrine system is a series of glands that release hormones into the bloodstream to help control your organs. We need our endocrine system to maintain homeostasis, grow and reproduce.

The hormones are used to regulate the following:

PREVIEW

- Me[illegible]m
- Gr[illegible]and [illegible]evelopm
- Sexual function
- Sleep
- Mood
- Stress
- Response to Injury



Endocrine System Exhibition Lab
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STATION 2

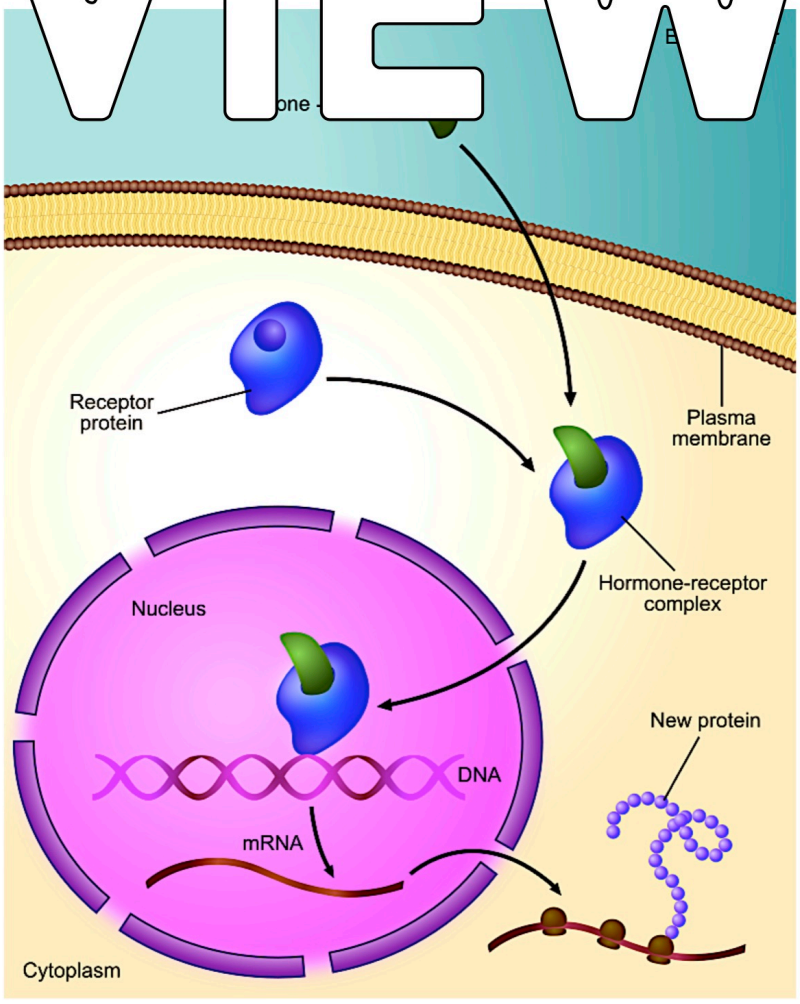
HORMONES

The chemicals produced by glands are called hormones. Hormones are specific to certain "target tissues" or cells.

Hormones are typically released in one part of the body and travel to the bloodstream to another. The part of the body that is affected by the hormone is called its "**target tissue**"

PREVIEW

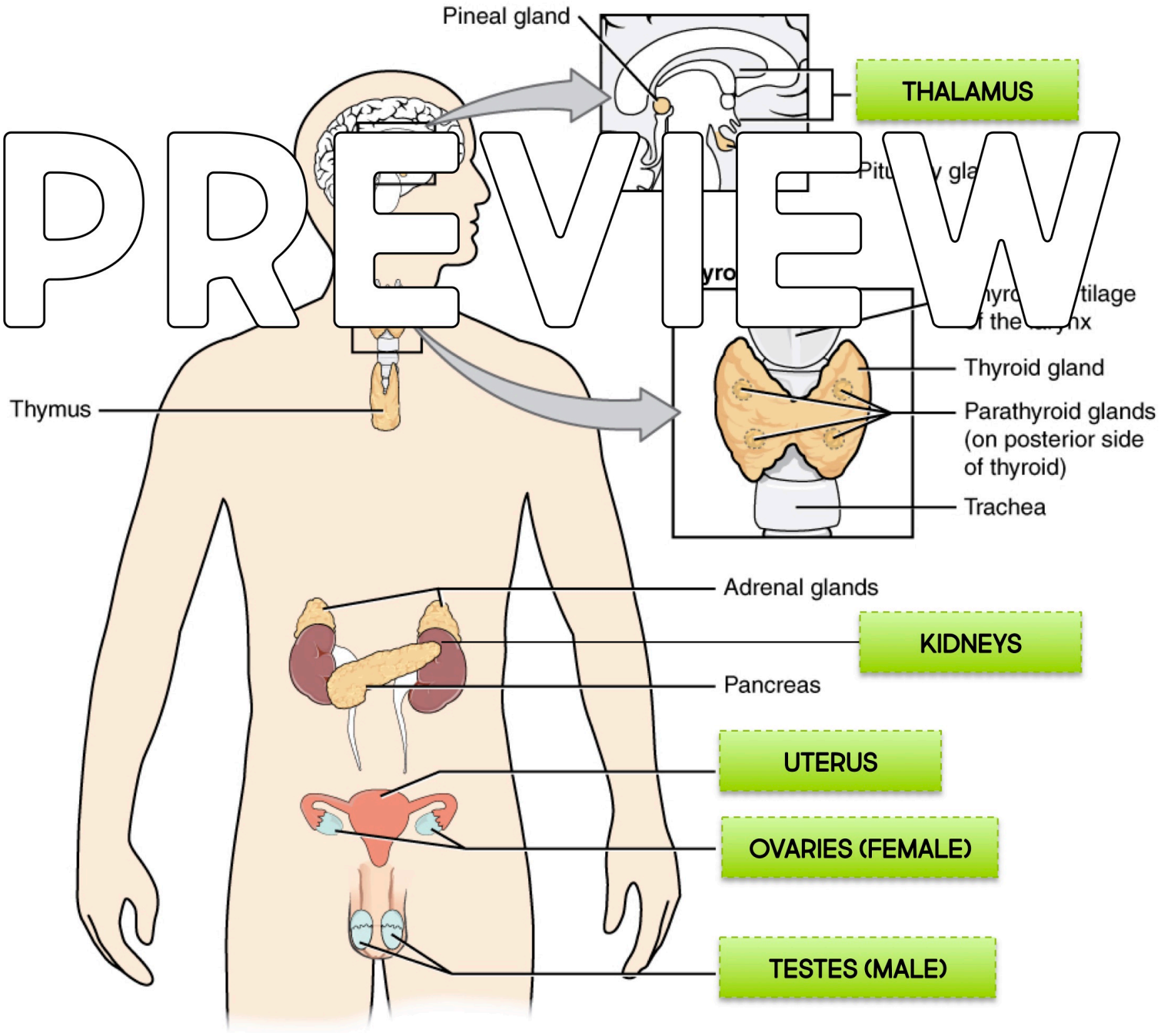
The hormones are able to influence the cells of the target tissue by attaching to specific receptors found on the plasma membrane or nuclei.



STATION 6

ORGANS with ENDOCRINE FUNCTION

The endocrine system contains many glands, but also relies on organs that have a secondary endocrine function.



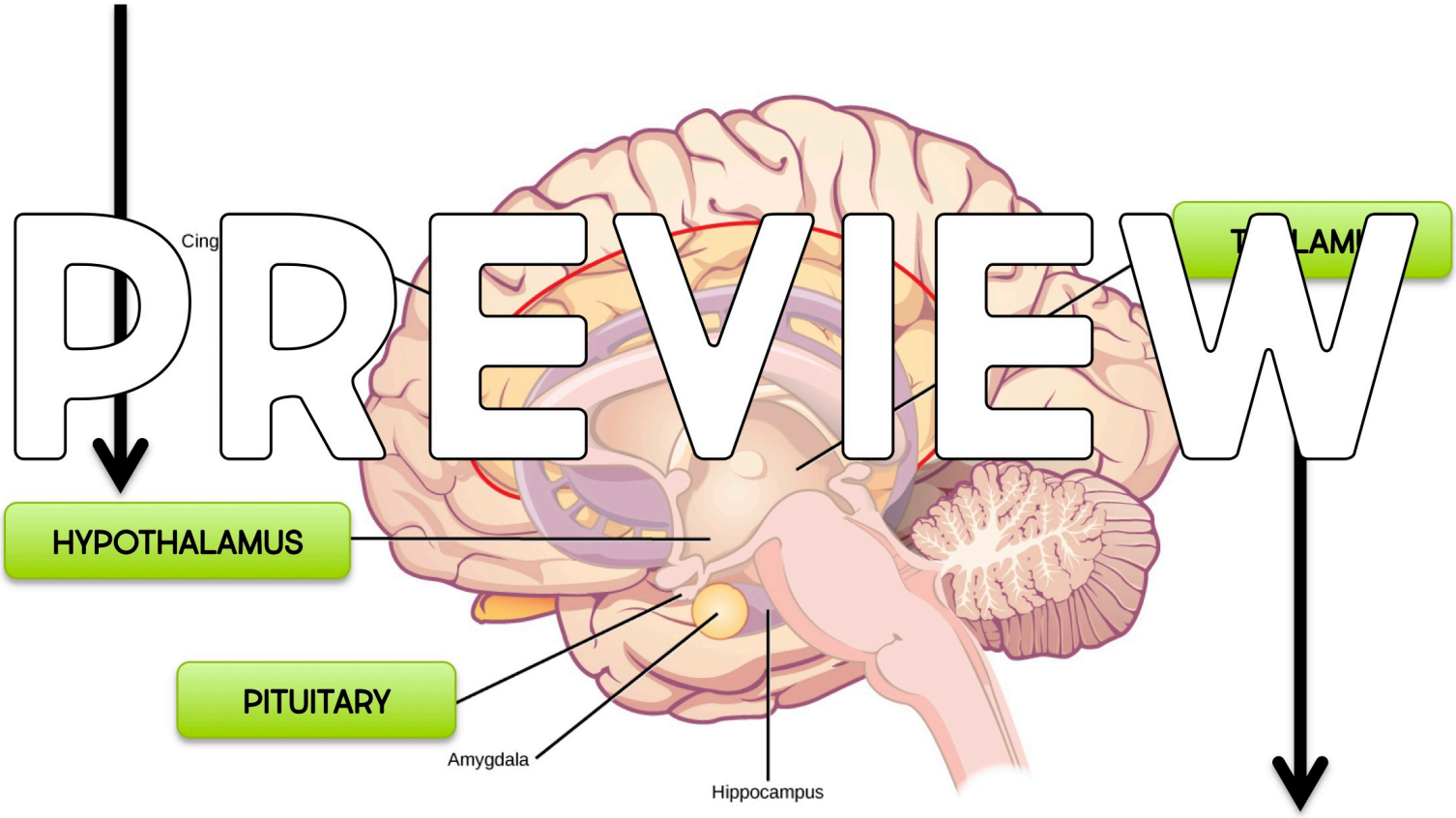
PREVIEW

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STATION 9

HYPOTHALAMUS

The hypothalamus' primary function is to maintain homeostasis in the body.



PREVIEW

The thalamus is an important part of the brain that plays a role in sleep and sensory interpretation.

The hypothalamus found between the thalamus and the pituitary gland within the brain.

STATION 12

HORMONES PRODUCED BY THE PITUITARY GLAND

The pituitary gland secretes nine hormones that directly regulate many body functions and controls the actions of other endocrine glands.

Pituitary	Hormone Secreted	Effect
Posterior pituitary	Anti-diuretic (ADH)	Simulates the kidneys to reabsorb water.
	Oxytocin	Simulations contractions of the uterus during childbirth; stimulates the release of milk
Anterior pituitary	Follicle stimulating hormone (FSH)	Stimulates production of eggs and sperm
	Luteinizing hormone	Stimulates cells to produce testosterone
	Thyroid stimulating hormone (TSH)	Stimulates the production of thyroxine from thyroid gland
	Adrenocorticotropic hormone (ACTH)	Stimulates the release of hormones from the adrenal cortex, including cortisol.
	Growth hormone (GH)	Stimulates protein synthesis and growth in cells
	Prolactin	Stimulates milk production in nursing mothers
	Melanocyte stimulating hormone (MSH)	Stimulates melanocytes to produce melanin (skin pigment)

PREVIEW

STATION 19 CONTINUED

FEEDBACK MECHANISM: WATER BALANCE

Why does exercising cause you to feel thirsty?

Hypothalamus senses that body is dehydrated → Hypothalamus stimulates pituitary to release ADH (antidiuretic hormone).

PREVIEW

The target tissue for the ADH hormone is the kidneys. This causes the kidneys to retain water instead of releasing it as waste. This causes you to feel thirsty so that you replace any lost water.

As the water in the blood reaches a more normal state, the hypothalamus stops the pituitary from making more ADH.



STATION 24

HYPERTHYROIDISM

PREFIX	MEANING
Hypo	Low
Hyper	High

Hyperthyroidism

Hyperthyroidism is an overactive thyroid- your thyroid secretes too much of the thyroid hormones.

Symptoms of Hyperthyroidism

W[illegible]h[illegible]oss, cr[illegible] [illegible]ear[illegible]a[illegible]irri[illegible]bil[illegible]m[illegible]ir[illegible]s[illegible]e
tremor[illegible]stles[illegible]es

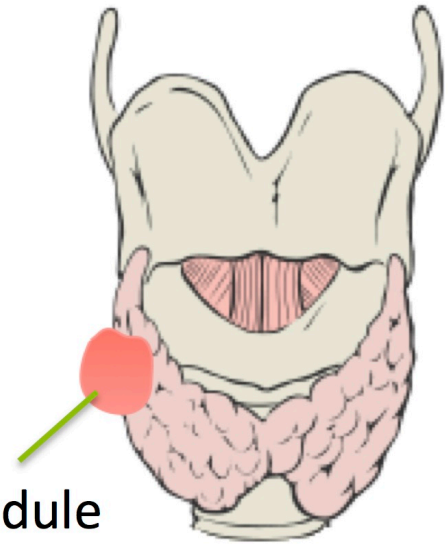
PREVIEW

There many causes of hyperthyroidism, including an autoimmune disease called Graves disease, which produces antibodies that cause the thyroid to produce more hormones.

Other Causes:

Hyper functioning thyroid nodules, thyroiditis, or cancer.

Nodules are commonly associated with hyperthyroidism, because they can start to produce their own thyroid hormones. However, nodules are fairly common and most are harmless and not related to hyperthyroidism.



ENDOCRINE STUDENT ANSWER SHEET

Name: _____ Date: _____

ENDOCRINE SYSTEM EXHIBITION STATIONS

Station 1) Functions

The endocrine system is a series of _____ that release _____ into the bloodstream to help _____ your _____.

You need your endocrine system to maintain _____, _____ and _____.

The hormones are used to regulate:

- ✓ _____
- ✓ Growth and _____
- ✓ _____ function
- ✓ _____
- ✓ _____
- ✓ _____
- ✓ _____
- ✓ Response to _____

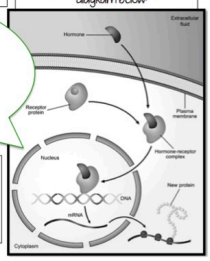
Station 2) Hormones

The _____ produced by _____ are called hormones.

Hormones are _____ to certain "_____" or cells.

How can a hormone influence certain cells?

Explain what's happening in the diagram below:



Station 3) The Four Main Parts of the Endocrine System are as follows:

1. _____ 3. _____
2. _____ 4. _____

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ENDOCRINE SYSTEM EXHIBITION STATIONS

Station 4) ENDOCRINE SYSTEM ANALOGY

Read through station 4 and determine which part of the analogy (text message, radio waves, cell phone) represents which part of the endocrine system: **hormones, bloodstream, receptor/ target cell**

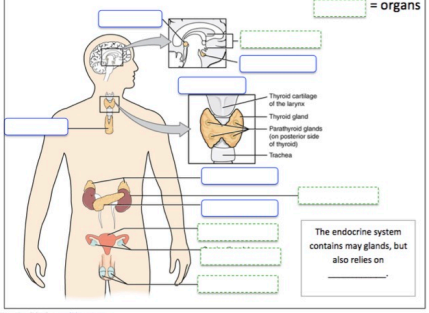


Each part of the endocrine system works together to _____ a _____ or _____ so that your body can _____ to maintain homeostasis. This involves a series of messages or _____.

Station 5 GLANDS and Station 6 ORGANS

_____ = glands

_____ = organs



The endocrine system contains may glands, but also relies on _____.

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Station 7) Examples of Hormones

The effects of hormones can be _____. It could take _____ or even several _____ for a cell to fully _____.

Gland/ Organ	Hormone Produced	Function	Location of gland (info is found at station 5)
	_____ Norepinephrine	Helps body _____.	
Pineal gland	_____	Regulates _____-_____ cycles	
	Thyroxine	Regulates _____	
		Regulates _____ _____	
Ovary		Estrogen assists with the development of _____ and development of _____. Progesterone prepares the _____ for a _____.	
		Responsible for _____ _____ and development of _____ sex characteristics	

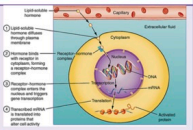
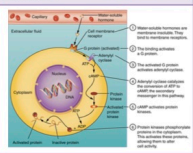
Station 8) Hormone Action

Two general groups of hormones: _____ hormones and _____ hormones.

	Steroid Hormone	Amino Acid Hormone
What is the hormone made out of?		
Can it pass through the cell membrane? (Y/N)		
Where is receptor located?		
Does it rely on secondary messengers? (Y/N)		
Can affect genes and produce dramatic changes (Y/N)		

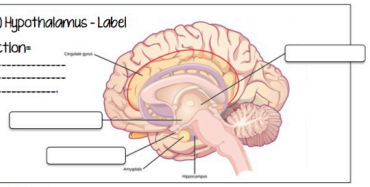
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Station 8) Hormone Action Continued

	Diagram (see station)	Determine which type of hormone (steroid or amino acid) is being depicted in the diagram. Explain why (writing "because the diagram said so is not a valid answer").
A		
B		

Station 9) Hypothalamus - Label

Main function=



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Station 10) Pituitary Gland

The _____ _____ is the _____ endocrine gland- it controls the other endocrine glands (and it's only the size of a _____!)

How are the hypothalamus and pituitary connected? _____

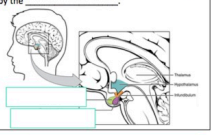
When the hypothalamus sends a message to the pituitary, it _____ its own _____ or _____ to release theirs.

Station 11) Anterior and posterior parts of the pituitary

Front part of pituitary= _____

Back part of pituitary = _____

Posterior pituitary is a projection of the _____; it (circle one) [does | does not] make its own hormones, but it does _____ hormones created by the _____.



Station 12) Hormones Produced by the Pituitary Gland

Pituitary	Hormone Secreted	Effect
_____ pituitary	_____ (ADH)	Simulates the _____ to _____
		Simulations contractions of the uterus during _____; stimulates the release of _____
_____ pituitary	Follicle stimulating hormone (_____)	Stimulates the _____ of _____ and _____.
	Luteinizing hormone	Stimulates cells to _____ _____ and _____
	Thyroid stimulating hormone (_____)	Stimulates the production of _____ from _____ gland
	_____ _____ (ACTH)	Stimulates the release of hormones from the adrenal cortex, including cortisol.
	_____ hormone (GH)	Stimulates protein synthesis and growth in cells
	_____	Stimulates _____ _____ in nursing mothers
	Melanocyte stimulating hormone (_____)	Stimulates melanocytes to produce _____ (skin pigment)

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Station 13) Hypothalamus and Pituitary Together

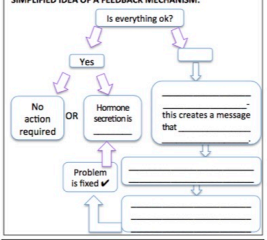
What is the role of the hypothalamus? _____

How does the hypothalamus help to achieve homeostasis? _____

Station 14) Control of the Endocrine

The endocrine system is regulated by _____ that function to maintain homeostasis.

SIMPLIFIED IDEA OF A FEEDBACK MECHANISM:



Station 15) Feedback Analogy

Explain how a feedback mechanism is like a thermostat:

What would the "homeostasis" be in this analogy? (Hint: look at the temperature on the thermostat).

Station 16) Negative Feedback Control

Problem Detected: _____

Why is this problem occurring? _____

What does your body do to help "fix" the problem?

How does this fix the problem? _____

What is the hypothalamus' role in this feedback loop? _____

Station 17) Illegal Use of HGH

What makes hGH "illegal"?

When is hGH prescribed?

Why is it prohibited in sports organizations? _____

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Station 18) Negative Feedback Control: Insulin

Problem Detected: _____

If blood sugar is low, the pancreas releases a hormone called _____. What is glucagon's target tissue? _____.

If blood sugar is high, the pancreas can release _____, which targets _____ cells to _____.

Name one other way the body may react to low blood sugar (hint: see station 16). _____

Station 19) Feedback Mechanism: Water Balance

Why do you sweat during exercise?

How might sweating negatively affect your body? _____

What does the hypothalamus do if you are dehydrated? _____

Hormone = _____

Target = _____

What does the antidiuretic hormone (ADH) do? _____

Explain: Does the body continuously release ADH? Why or why not? _____

Station 20) Adrenal Hormones

Where are the adrenal glands located?

When is adrenaline released? _____

What are adrenaline's target tissues? _____

When do you think it might be important for your body to use adrenaline? _____

Station 21) Thyroid Gland

The thyroid gland is a _____-shaped gland located above the _____ of the _____.

How does the pituitary control the thyroid gland? _____

HORMONES SECRETED BY THE THYROID:

- Metabolism is controlled by _____.
- Growth and development, metabolism and heart rate is controlled by _____.
- Calcium levels are controlled by _____.

Station 22) Metabolism

Thyroxine is a hormone produced by the _____ gland that helps regulate _____.

How? _____

Low thryoxine causes the hypothalamus to release _____, → which stimulates the _____ to release _____; →this stimulates the thyroid to make more _____; → the hypothalamus senses this and _____ secreting TRH.

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Station 23) Hypothyroidism

Hypothyroidism= _____ thyroid. Symptoms include slow _____, and a _____ feeling, leading to _____ _____.

Leading cause=

_____

Eating foods high in iodine, such as seafood, _____, and raw _____ products can reverse hypothyroidism.

Station 24) Hyperthyroidism

Hyperthyroidism= _____ thyroid. Symptoms include weight _____, _____, warm _____, tremors, _____.

Causes include an _____ disease called _____ disease, hyper functioning thyroid _____, or _____.

*Nodules are common and most are _____.

Station 25) Parathyroid

Parathyroid glands are tiny glands located on the _____, each about the size of a _____ of _____. They produce the _____ hormone (PTH), which raises _____ levels in _____.

Calcium is needed for your bones, _____, _____, and _____ system.

_____ senses low _____ → stimulates _____ glands to produce _____ → PTH causes calcium to be _____ from places it's stored in the body: the _____ and _____ → Calcium is released into the _____ in what is known as _____.

*What do you think the hypothalamus does (or does not do) from this point? _____

Station 26) Diabetes

What is hyperglycemia? _____

What is diabetes? _____

Typically, when blood sugar is too high, the _____ secretes _____, which _____ the amount of _____ in the blood.

Type I Diabetes- pancreas does not produce insulin as it should due to a defect that causes the body's _____ system to attack the _____ producing _____ of the pancreas.

Treatment includes insulin _____ or other medication.

Type II Diabetes- typically _____ or related to _____. Muscles and organs have an insulin _____; they do not react to insulin.

Treatment: _____, _____ and medications.

Station 27) Endocrinologist

Name 5 things that an endocrinologist may be able to help treat:

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*Shortened version also included for younger grades or time constraints.

Recommended for grades 9+

Editable version available.

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