Grade 6 Science
Week of October 5 – October 9

The Hormonal System

The Endocrine System

The **endocrine system** is a complicated system that is composed of many **glands that release hormones**. Let's break that sentence down.

First, what is a gland? **Glands are organs**, each with a different purpose in your body. Some glands, like salivary glands (which produce saliva in your mouth) are not part of your endocrine system. The glands that are a part of your endocrine system **release hormones**. Hormones are **special chemicals your body** that tell your body what to do and how to grow. When they are released, they go **directly into your blood** traveling to their destination.

Of all of the glands in the endocrine system, **the pituitary gland**, which is about the size of a pea, is the "**master gland**". It makes and releases a bunch of hormones that control all the other glands in the body. It is extremely small and tucked beneath your brain.

We will focus on three specific parts of the endocrine system responsible for making some important hormones: the **thyroid gland**, the **adrenal gland**, and the **pancreas.**

Complete the following:

The endocrine system is composed of:

_____

True or False: If a statement is false, change it so that it is true.

1) Glands are organs. _____

2) Salivary glands are a part of the endocrine system. _____

3) Hormones are released directly into your bloodstream. _____

26. Where is the hypothalamus found and what does it do?

_____

_____

_____

27. Which gland is referred to as the “master gland” and controls many of the other endocrine glands in the body?

_____

Check out this video as an introduction into this complex system:
https://youtu.be/HXPCQBD_WGI

Video: How the Endocrine System Works

Watch the video “How the Endocrine System Works” to answer the following questions:

1) Where is the pituitary gland located? _____

2) What is the name of the hormones that the thyroid gland releases?

_____

3) What is the biggest gland of the endocrine system?

_____

4) What do the ovaries do?

_____

5) What do the testes do?

_____

What Are Hormones?

Hormones are **chemical substances that act as messengers** in your body. After being made in one part of the body, they travel to other parts of the body where they **help control how cells and organs do their work**. Hormones are especially important when you start to go through **puberty**, which is when you begin developing into an adult. During this time, you're loaded with hormones that tell your body that it's time to start changing.

Watch the video below to learn more about how hormones work:
https://youtu.be/M5icHaHvQQc

Video: Operation Ouch- Hormones Watch the video "Operation Ouch- Hormones" to answer the following

1) Can you tell your hormones what to do? _____

2) Do you have hormones since birth? _____

3) Which gland creates a hormone that helps your body prepare for immediate action? _____

6) Which gland is found at the base of the brain?

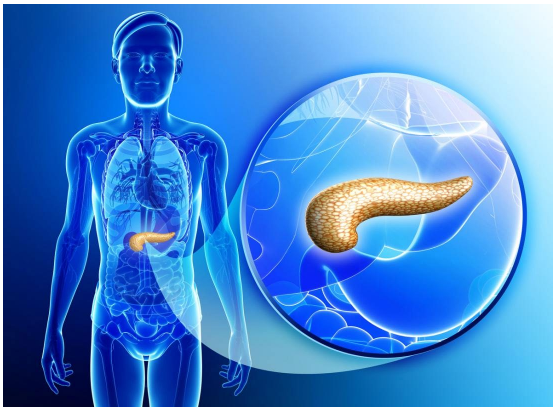
_____

7) Which larynx had a deeper sound, the larger larynx or the smaller larynx? _____

8) Which gland signals for puberty to begin? _____

The Pancreas

The pancreas is an extremely important gland. It is a hormone-secreting (releases hormones) gland and it also releases digestive enzymes into the small intestine to help digest fats, carbohydrates, and proteins. This image shows where your pancreas is located in your body. The pancreas is the largest endocrine gland.



The most important hormone that your pancreas releases is called **insulin**. Insulin moves **glucose** (sugar) from your bloodstream into your muscles and other tissues, which gives you **energy.** But sometimes peoples pancreas doesn't work properly...

So what happens when your pancreas **doesn't produce insulin?** This is called **type 1 diabetes**. People who have type 1 diabetes have a **pancreas that doesn't produce insulin.** This can be a major problem since insulin controls the amount of sugar in your blood (your blood sugar).

 **Check out the video below** to see how type 1 diabetes affects insulin levels:

https://learning.burnabyschools.ca/wp-content/uploads/2020/10/final_5d3bfc4344356f00147972ed_907254.mp4

What is the largest endocrine gland? _____

Explain how insulin works.

_____

_____

_____

_____

Fill in the blanks: People who have _____ have a pancreas that doesn't produce _____.

What must you do if your blood sugar is too low? (Answer found in the video clip)

_____

_____

Adrenal Gland

Your adrenal glands are extremely important to your body when you are stressed or very sick. These are two triangular-shaped glands, each one on top of your kidneys. They kind of look like a hat on each of your kidneys.

The role of the adrenal glands in your body is to release certain hormones directly into the bloodstream. Many of these hormones have to do with how the body responds to stress, and some are vital to existence. The adrenal glands have two parts each producing a different set of hormones.

One of the hormones released by your adrenal glands is called **adrenaline**. Have you ever heard of someone gaining "super strength" in a time of crisis? This is because adrenaline is released into the body during times of severe stress or danger. Adrenaline increases blood pressure and heart rate which **pushes extra oxygen into your muscles**, making them energized and ready to react when the body experiences stress. This can make you react faster and better than your body normally does.

In an adrenaline rush:

"The body pulls out all the stops and lets you turn up the dial to '11'. You don't feel the ache of your muscles. You don't feel the pain. You just do what needs to be done."

-Scientific America

How many adrenal glands do you have and where are the adrenal glands located?

_____

_____

Explain how adrenaline works.

_____

_____

_____

_____

Thyroid Gland

The thyroid is shaped like a little butterfly or bow tie and it sits under the skin in the front of your neck. To find it, touch your throat around the middle. Now, swallow. Do you feel something moving upwards when you do that? That's your thyroid gland. Your thyroid gland is one of the largest and most important endocrine glands in your body.

Your thyroid has a long list of ways that it helps your body function properly. It makes sure that the cells in your body are working properly. Through releasing hormones, it **delivers messages** to your cells. As messengers, your hormones job is to instruct the cells in your body when to consume oxygen and nutrients. This is called **metabolism**—the way your body uses energy.

What does the thyroid gland look like and where is it located?

_____

_____

What is metabolism?

_____

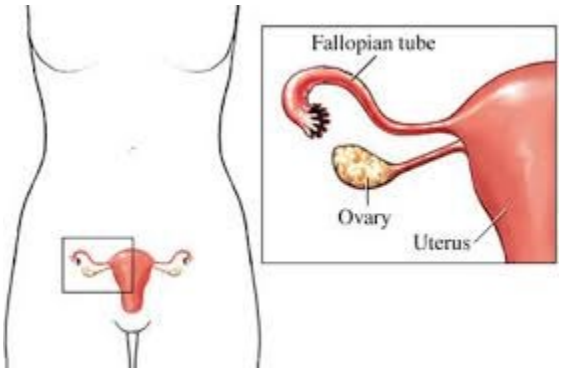
Puberty: What is it?

Puberty is when your body begins to **develop** and **change** as you move from **kid to adult**. During puberty, your body will grow faster than at any other time in your life (other than when you were a baby). Usually, puberty typically **starts** between ages **8 and 14** in a person with a female biological anatomy and ages **9 and 16** in a person with a male biological anatomy. The changes that take place can look different and have a different timeline for everyone. It all depends on when your body feels ready to start.

It all starts in the **pituitary gland**. Puberty happens to everyone, but it will look different from person to person.

When a person with male biological anatomy begins puberty, the pituitary gland sends a **signal to their testes** that it's time to start making a hormone called **testosterone**. Testosterone is the hormone that makes all the changes in order for a person with a male biological anatomy to grow into an adult. This means changes like their voice deeper, growing facial and body hair and much more.

When a person with female biological anatomy begins puberty, the pituitary gland **signals to their ovaries** that it's time to start making a hormone called **estrogen**. Estrogen is the hormone that makes all the changes in order for a person with a female biological anatomy to grow into an adult. This means changes like growing breasts, getting a period and much more.



Puberty essentially pushes a person's hormones into **overdrive**! New hormones are introduced into your body, and your hormonal levels are high. During puberty, it may sometimes feel like you're on an emotional rollercoaster. This might mean that one minute your happy, and the next you're angry or sad for no reason. This is called a **mood swing** and this is caused by your hormones. It can be difficult to manage these intense feelings because they are a result of the changes going on in your body.

Have you ever experiences mood swings? How do you handle them?

Rapunzel's Mood Swings: https://youtu.be/00abpt7AVDU

True or False: If a statement is false, change it so that it is true.

1) During puberty, your body will grow slower than at any other time in your life.

_____

2) Everyone starts puberty at the same time.

_____

3) The effects of puberty will be the same for everyone.

_____

Between what ages does puberty start for a person with a biological female anatomy: _____

Between what ages does puberty start for a person with a biological male anatomy: _____

The pituitary gland signals what part of the male anatomy in order to begin the production of testosterone? _____

The pituitary gland signals what part of the female anatomy in order to begin the production of estrogen? _____

What is a mood swing?

_____

_____

_____

Label the endocrine system:

Word Bank

- Adrenal gland
- Pituitary gland
- Pancreas
- Thyroid gland
- Testes
- Ovary