GET TO KNOW YOUR PANCREAS

PROMISE

SANFORD RESEARCH

WHAT HAPPENS TO FOOD AFTER YOU EAT IT?

Take one piece of paper and divide it into 3 columns.

Label each column with one of these words:

K=Know

W=Want to know

L= Learned

KNOW	WANT TO KNOW	LEARNED

WHAT HAPPENS TO FOOD AFTER YOU EAT IT?

In the K column, write about what you **know** about this question.

In the W column, write about what questions you have. What do you **want** to know?

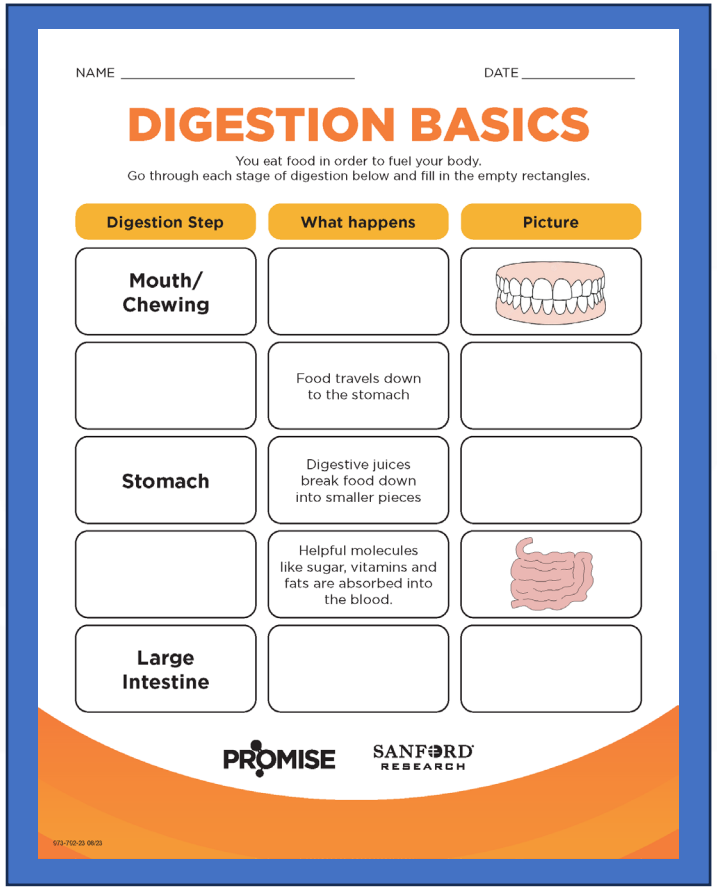
Leave the L column blank for now. This is where you will summarize what you **learned**.

WATCH THIS VIDEO

WHAT DID YOU LEARN?

Fill in the blank spaces on the Digestive Basics Worksheet.

Go back and fill in the L column on your KWL chart



NAME _____ DATE _____

DIGESTION BASICS

You eat food in order to fuel your body.
Go through each stage of digestion below and fill in the empty rectangles.

Digestion Step	What happens	Picture
Mouth/ Chewing		
	Food travels down to the stomach	
Stomach	Digestive juices break food down into smaller pieces	
	Helpful molecules like sugar, vitamins and fats are absorbed into the blood.	
Large Intestine		

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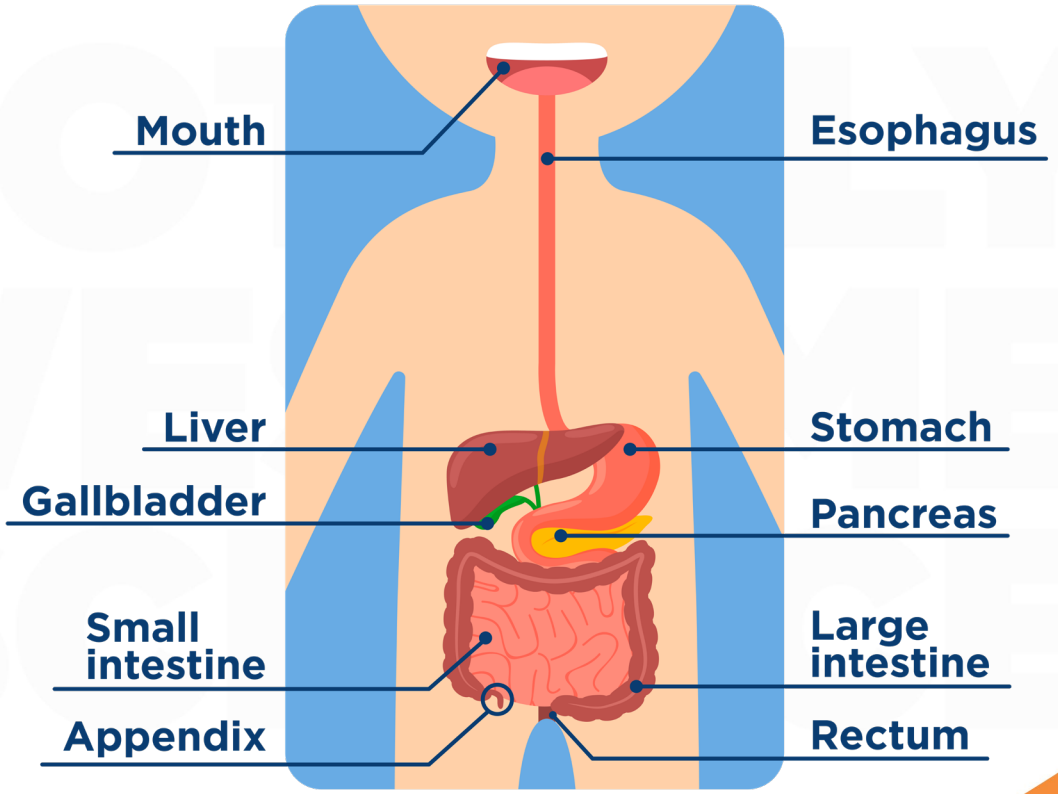
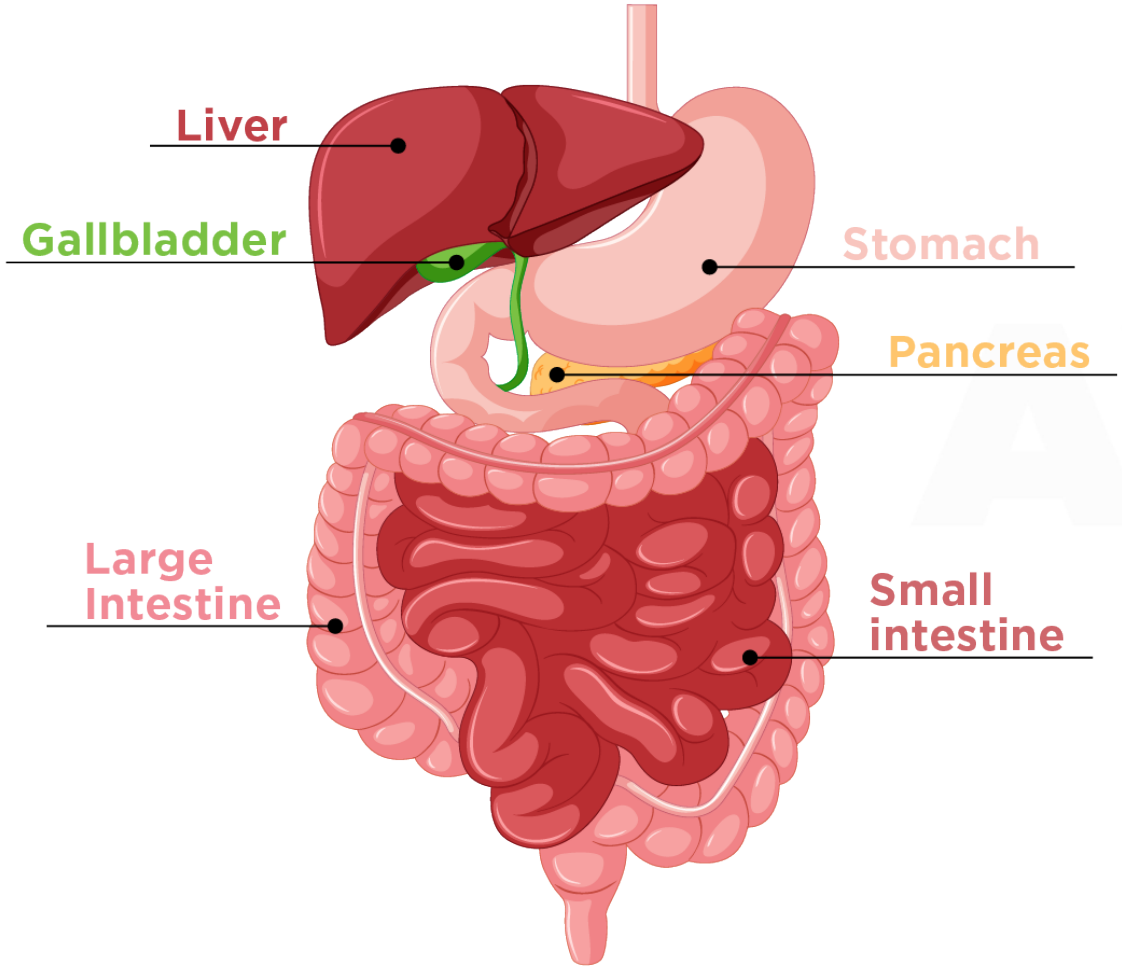
CHECK YOUR ANSWERS

DIGESTION STEP	WHAT HAPPENS
Mouth/Chewing	Food is broken down into smaller pieces
Esophagus	Pushes food down to the stomach
Stomach	Digestive juices break food down into smaller pieces.
Small Intestine	Helpful molecules like sugar, vitamins, and fats are absorbed into the blood.
Large Intestine	Water is absorbed from the waste and stored until it is ready to leave the body.



BLOOD SUGAR



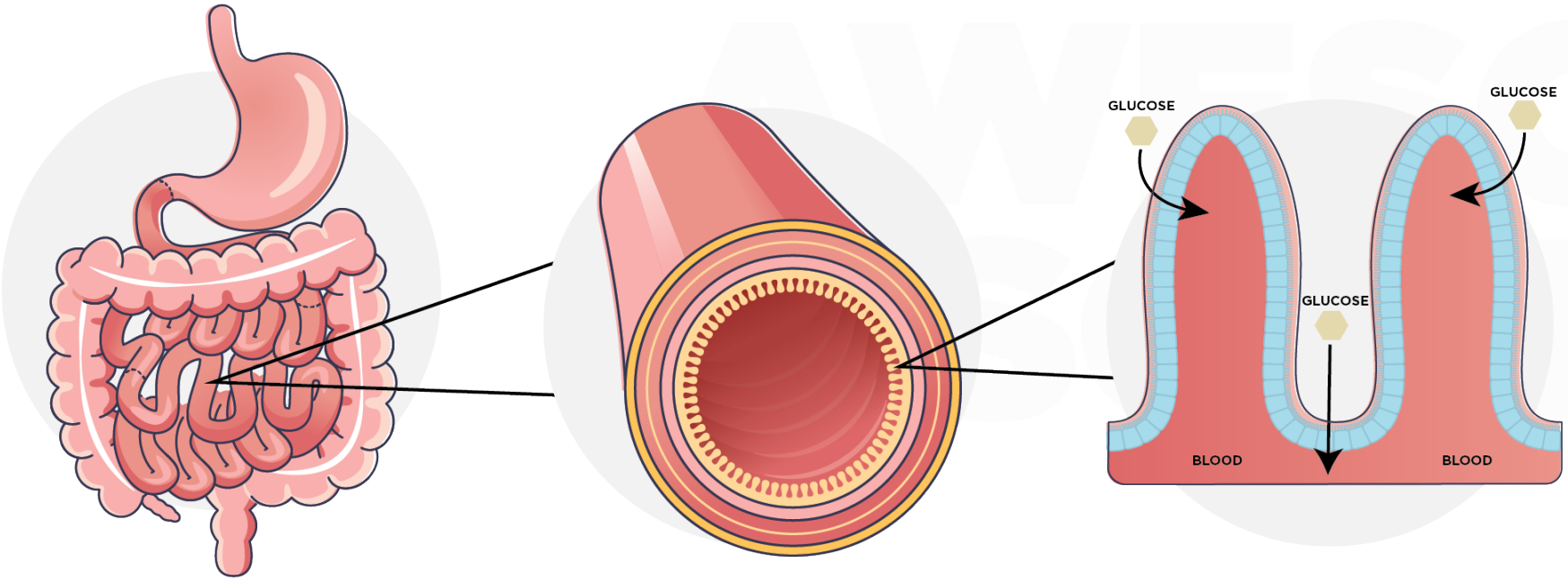
The digestive system removes all sugar (glucose) from food.

The small intestine moves the glucose into the blood.

What happens after that?

GLUCOSE MOVES INTO YOUR BLOOD

Glucose moves into the blood where it can travel to all the cells in your body!



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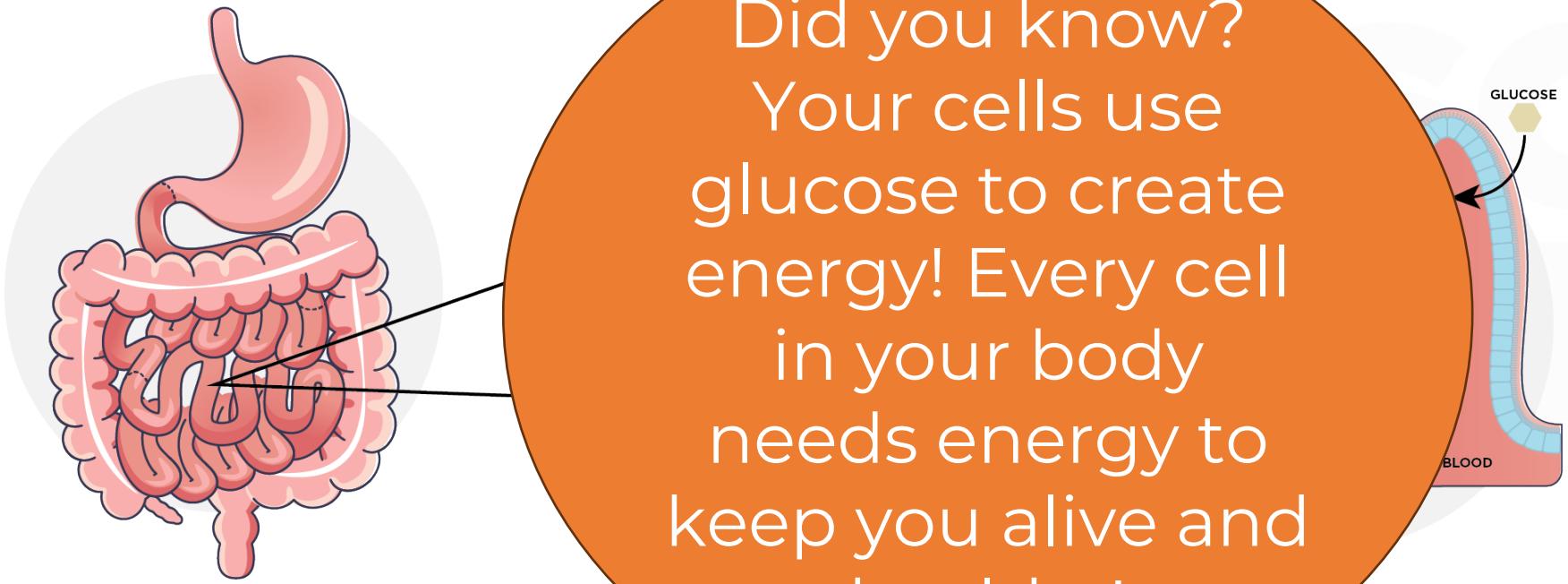


Did you know? Your cells use glucose to create energy! Every cell in your body needs energy to keep you alive and healthy!

EXPERIMENT TIME

The body is always trying to reach **homeostasis**- which means that it is in balance on the inside even though the outside is changing.

One way our body does this is to break down food and use it to make energy. This is called **metabolism.**

This experiment will help you to see how your pancreas helps with metabolism so your body can get to homeostasis.

WHAT DID YOU LEARN?

What did you learn from the experiment?
What surprised you?
What questions do you have?

WHAT DID YOU LEARN?

What did you learn from the experiment?

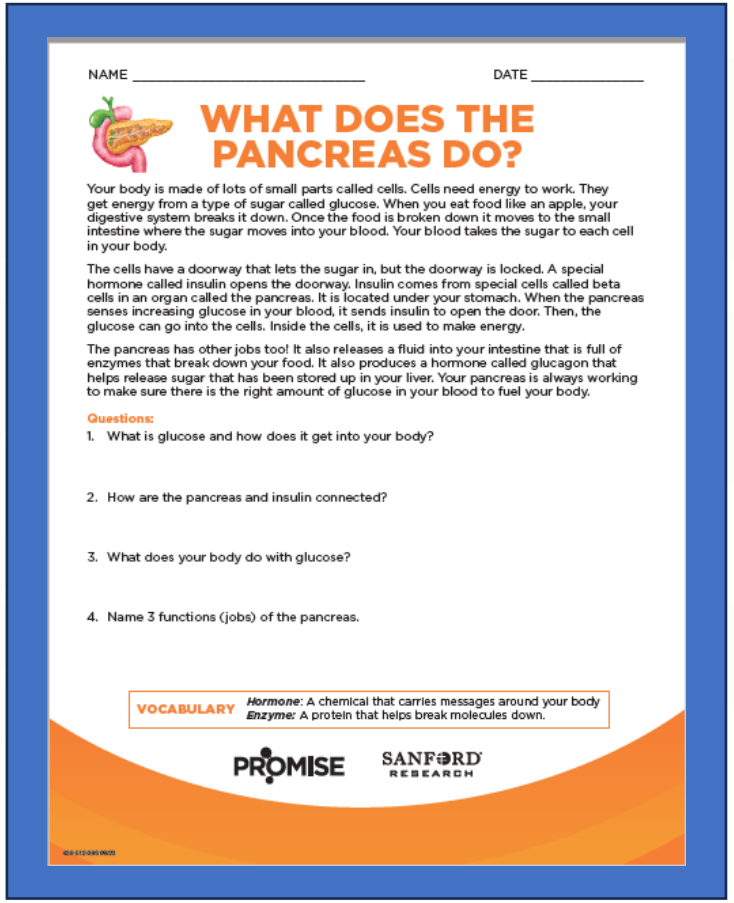
What questions do you have?

DID YOU KNOW?
Insulin is a hormone, which is like a messenger in the body!

TIME TO READ

Read the article called “What Does the Pancreas Do?” and underline words you don’t know.

Answer the questions based off what you read.



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WHAT DOES THE PANCREAS DO?

Your body is made of lots of small parts called cells. Cells need energy to work. They get energy from a type of sugar called glucose. When you eat food like an apple, your digestive system breaks it down. Once the food is broken down it moves to the small intestine where the sugar moves into your blood. Your blood takes the sugar to each cell in your body.

The cells have a doorway that lets the sugar in, but the doorway is locked. A special hormone called insulin opens the doorway. Insulin comes from special cells called beta cells in an organ called the pancreas. It is located under your stomach. When the pancreas senses increasing glucose in your blood, it sends insulin to open the door. Then, the glucose can go into the cells. Inside the cells, it is used to make energy.

The pancreas has other jobs too! It also releases a fluid into your intestine that is full of enzymes that break down your food. It also produces a hormone called glucagon that helps release sugar that has been stored up in your liver. Your pancreas is always working to make sure there is the right amount of glucose in your blood to fuel your body.

Questions:

1. What is glucose and how does it get into your body?
2. How are the pancreas and insulin connected?
3. What does your body do with glucose?
4. Name 3 functions (jobs) of the pancreas.

VOCABULARY ***Hormone:*** A chemical that carries messages around your body
Enzyme: A protein that helps break molecules down.

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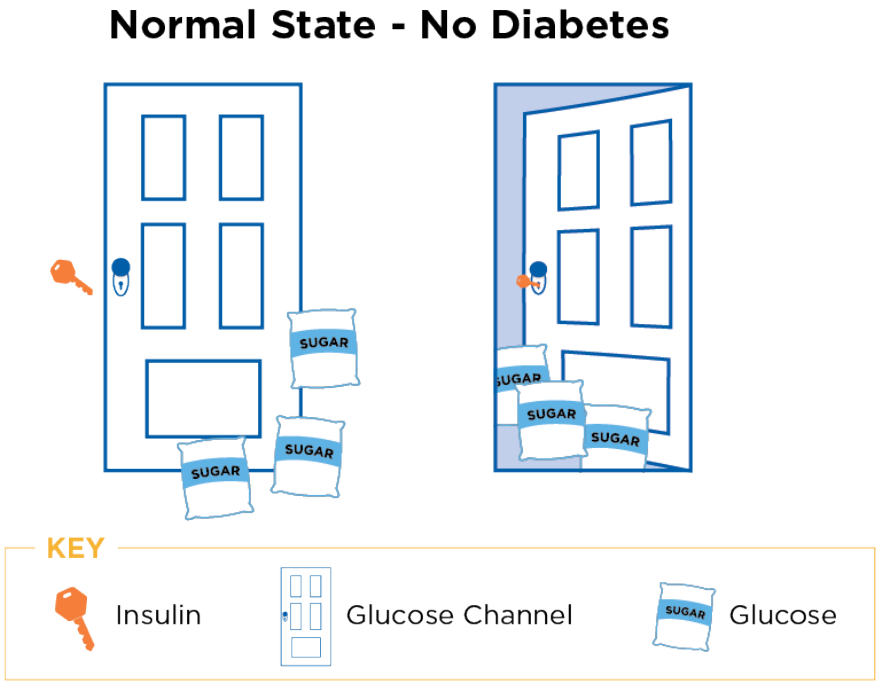
HOW INSULIN WORKS

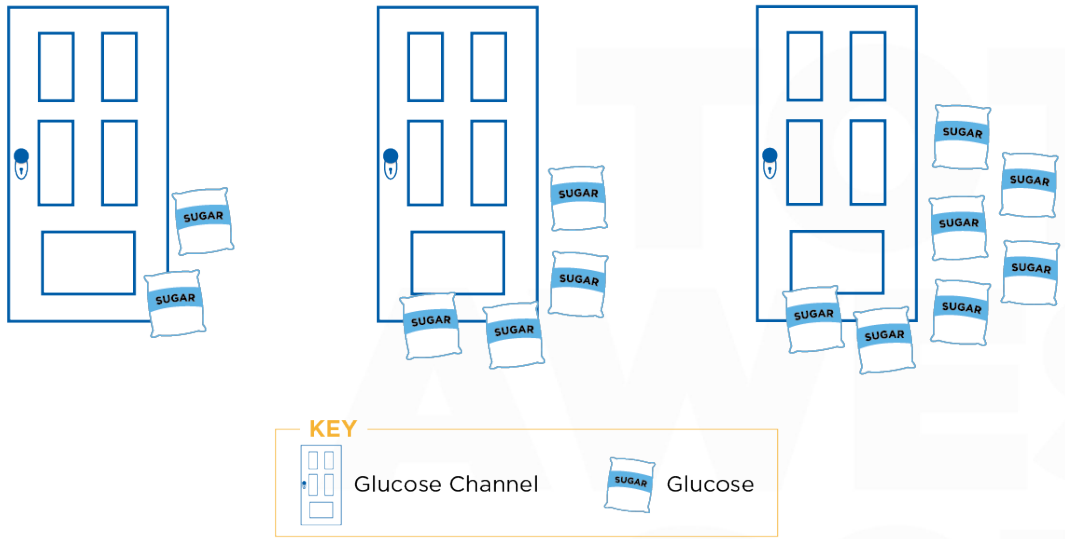


Your cells have a door that allows glucose to enter.

Insulin is needed to unlock that door.

If your body is working properly, when you have an increase in glucose in your blood, the pancreas releases insulin to move glucose into the cells.

Type 1 Diabetes

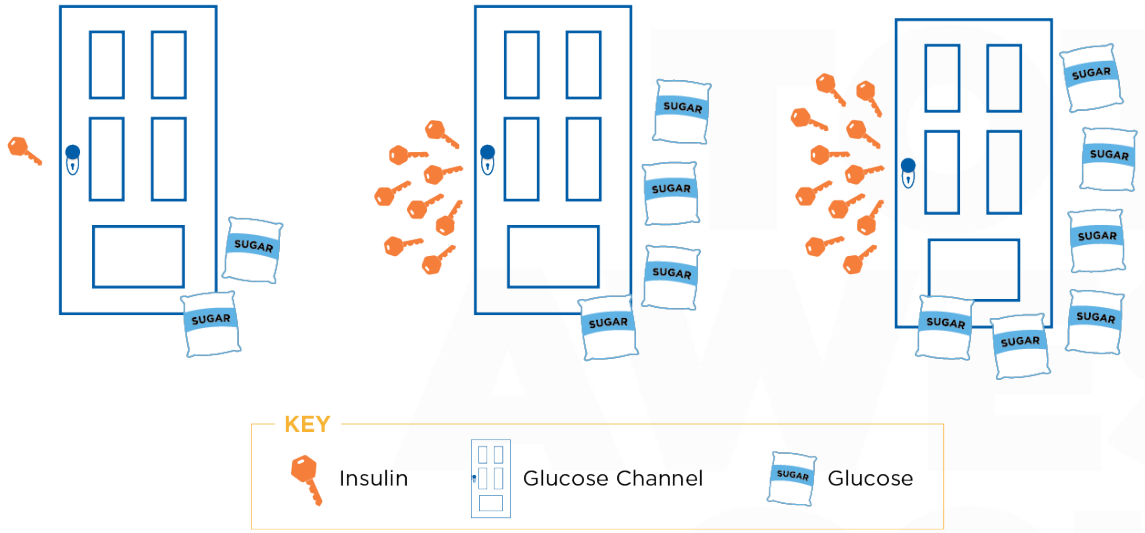


In Type 1 Diabetes, the immune system attacks the pancreas, so it stops making insulin.

With no insulin, the door cannot open, and glucose builds up in the blood. (High blood sugar)

Treatment: Insulin injections

Type 2 Diabetes



In Type 2 Diabetes the lock on the door becomes sticky!

This means that the door has a hard time opening even though there is insulin being made.

Treatment: Eat a healthy diet, medication

DIFFERENCES AMONG PEOPLE

Everyone's body is different so we each have our own way to maintain homeostasis.

Check out the "Daily Blood Sugar Activity" and see how two brothers manage blood sugar differently.

NAME _____ DATE _____

DAILY BLOOD SUGAR TRACKING

Jacob and Christopher are brothers. Jacob is 18 years old and Christopher is 16 years old. Christopher has just been diagnosed with type 1 diabetes. Type 1 diabetes is an autoimmune disorder, which means that the body has started to shut down the beta cells of the pancreas. The beta cells produce insulin, which helps sugar to enter cells. Jacob does not have diabetes.

Without insulin, the sugar cannot get into the cells and starts to build up in the bloodstream. It is normal for sugar levels to rise and fall throughout the day. Normal levels are between 70mg/dL and 140 mg/dL. (Milligrams per deciliter is a unit of measurement for blood sugar.)

Jacob and Christopher agreed to track their blood sugar levels for a whole day. Use the table of information to create a graph for each brother. Then answer the questions below. Use a different color for each brother and create two lines on the graph.

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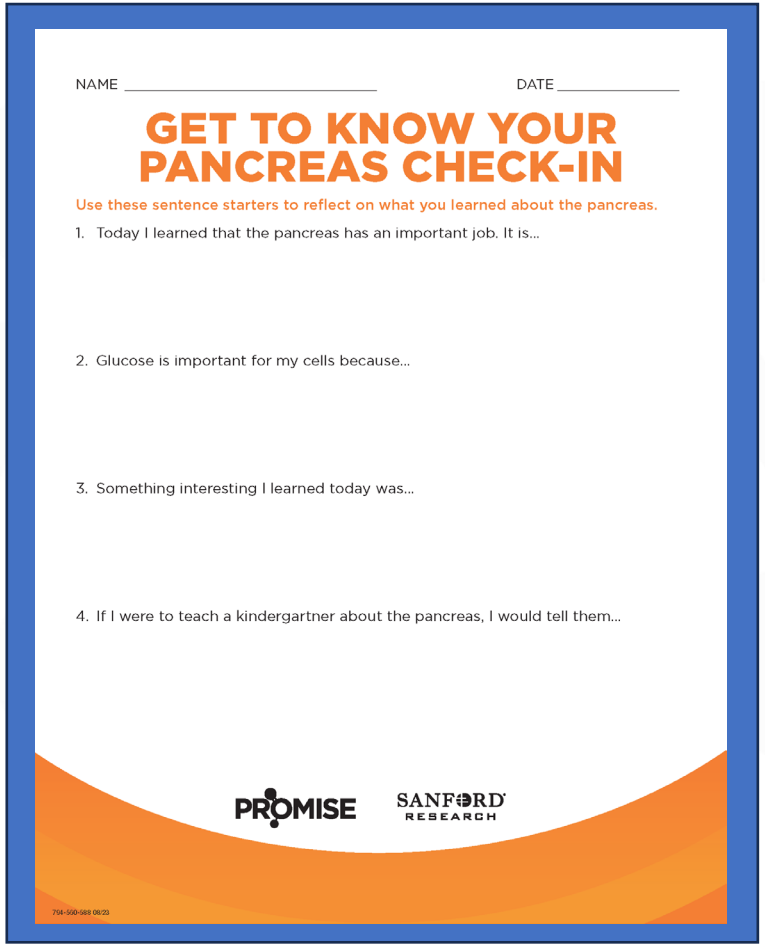
CHECK FOR UNDERSTANDING

Complete the “Get to Know Your Pancreas Check-In” printable to record what you learned.



NAME _____ DATE _____

GET TO KNOW YOUR PANCREAS CHECK-IN

Use these sentence starters to reflect on what you learned about the pancreas.

1. Today I learned that the pancreas has an important job. It is...

2. Glucose is important for my cells because...

3. Something interesting I learned today was...

4. If I were to teach a kindergartner about the pancreas, I would tell them...

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Meet the scientist

Dr. Kurt Griffin is a physician scientist at Sanford Health.

He established a study called PLEDGE that tries to find ways to predict if a child will develop Type 1 Diabetes.

He works with a team of scientists to help make this research study is a success.