

# Title - Controlling blood glucose levels

## LEARNING GOALS

- Recap hormones and why body's reactions to hormones are usually slower than nervous reactions
- Understand where insulin is produced and how it regulates blood glucose
- Recall how diabetes is caused and how it can be controlled

# What is Homeostasis?

Homeostasis - involves maintaining a constant environment in the body

- Homeostasis makes sure our body has the correct levels of;

Temperature

Water

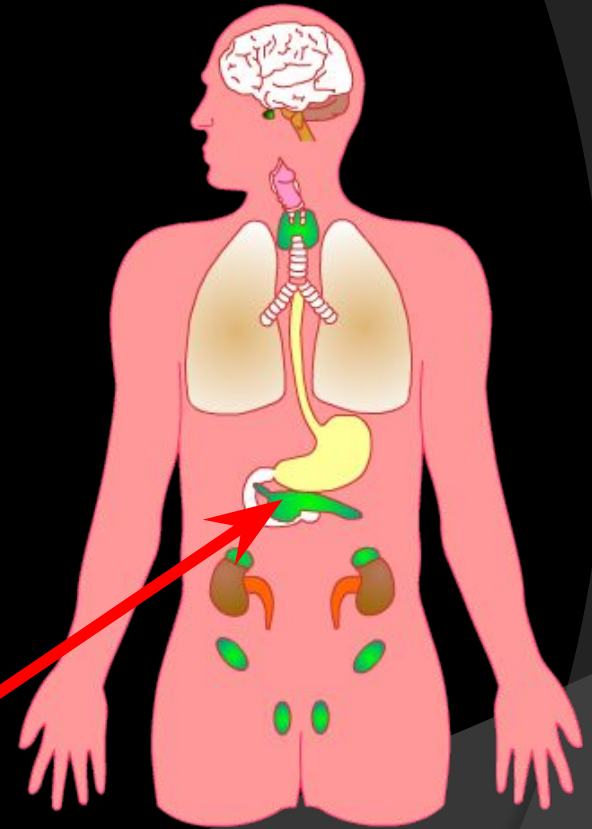
Oxygen

Carbon dioxide

Blood sugar

# Recap: What is a hormone?

- A chemical
- Hormones are secreted from our glands into the bloodstream.
- Travel in blood to target organs
- Regulate the functions of many organs and cells
- Coordinate many processes in the body
- Which gland produces the hormone insulin?



**Pancreas**

# Hormones generally produce a slower reaction than nerve impulses - Why?

- Hormones co-ordinate long-term changes such as maturation
- Hormones have to be made and then released from cells where they need to travel to their target organs in the blood
- Nerve impulses are generated quickly and travel directly to the effectors

# The Pancreas



- Insulin controls.....

blood sugar levels  
in our bodies.

- Glucose is a sugar needed by cells for **Respiration**.
- It is **important** that the concentration of glucose in the blood is kept at a constant level.

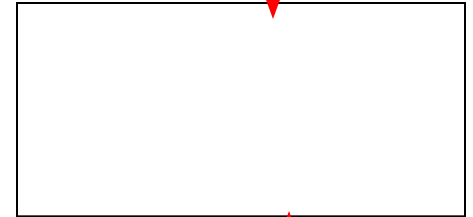
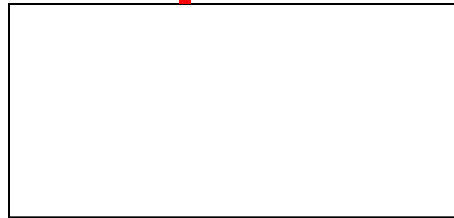
# Changing glucose levels

- After a meal the level of glucose in our bodies [increases]?
- After exercise the levels of glucose in our bodies [decreases]?
- Why do you think this happens?

# Controlling Blood Glucose Levels

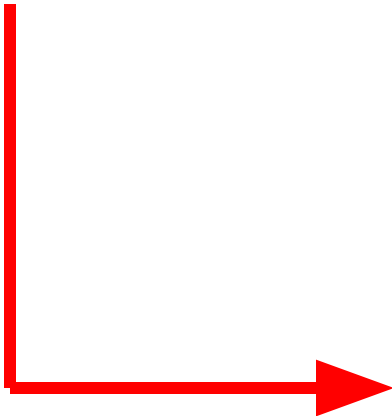
Glucose rises  
due to \_\_\_\_\_

Insulin produced by  
the \_\_\_\_\_  
travels in the \_\_\_\_\_  
to the liver and  
causes it to take up  
excess \_\_\_\_\_ and  
store it as \_\_\_\_\_.



Glucose falls  
due to \_\_\_\_\_

\_\_\_\_\_ is released  
by the pancreas and  
causes \_\_\_\_\_ in  
the liver to be  
converted back to  
glucose



# Controlling Blood Glucose Levels

Glucose rises  
due to eating

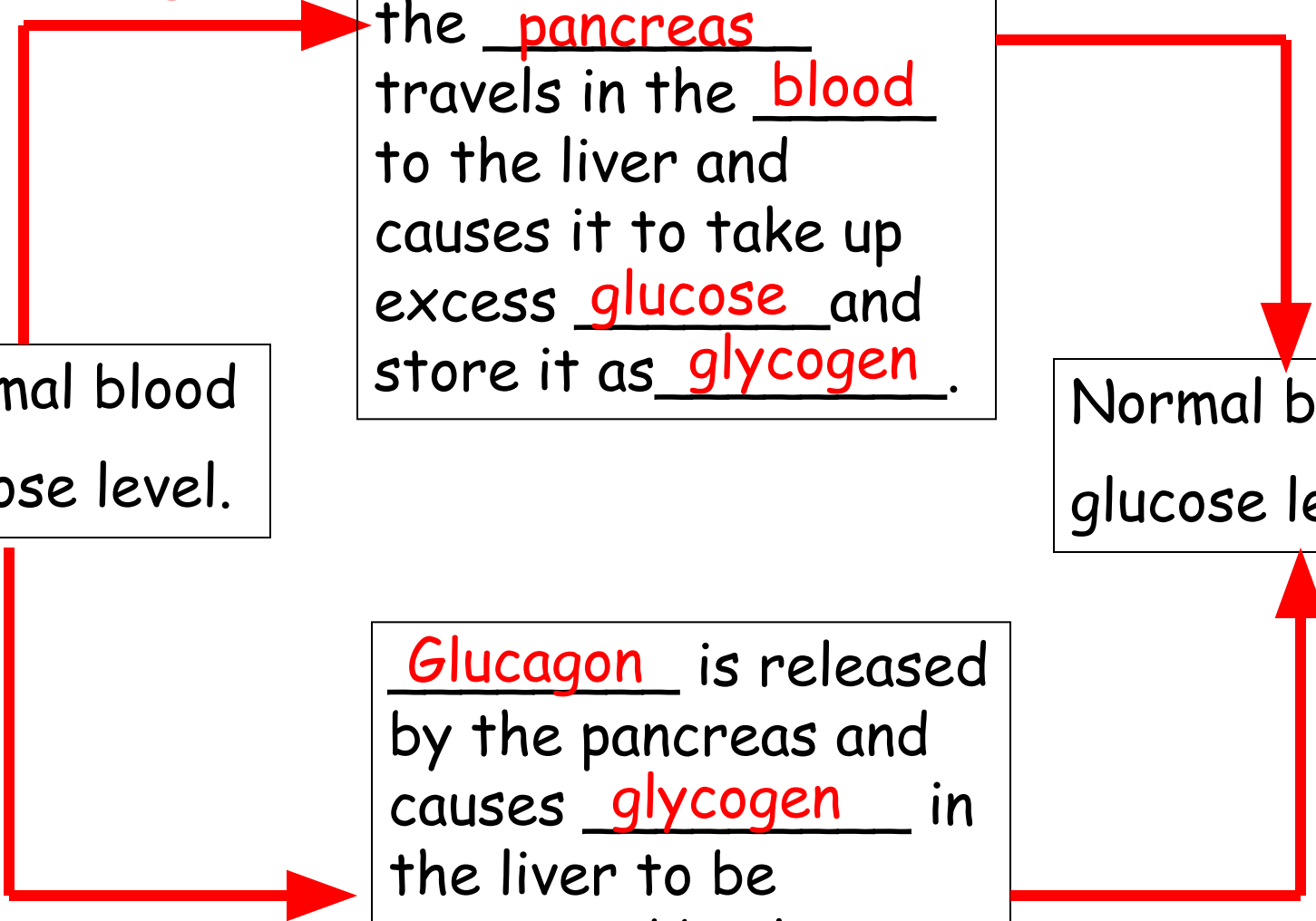
Insulin produced by  
the pancreas  
travels in the blood  
to the liver and  
causes it to take up  
excess glucose and  
store it as glycogen.

Normal blood  
glucose level.

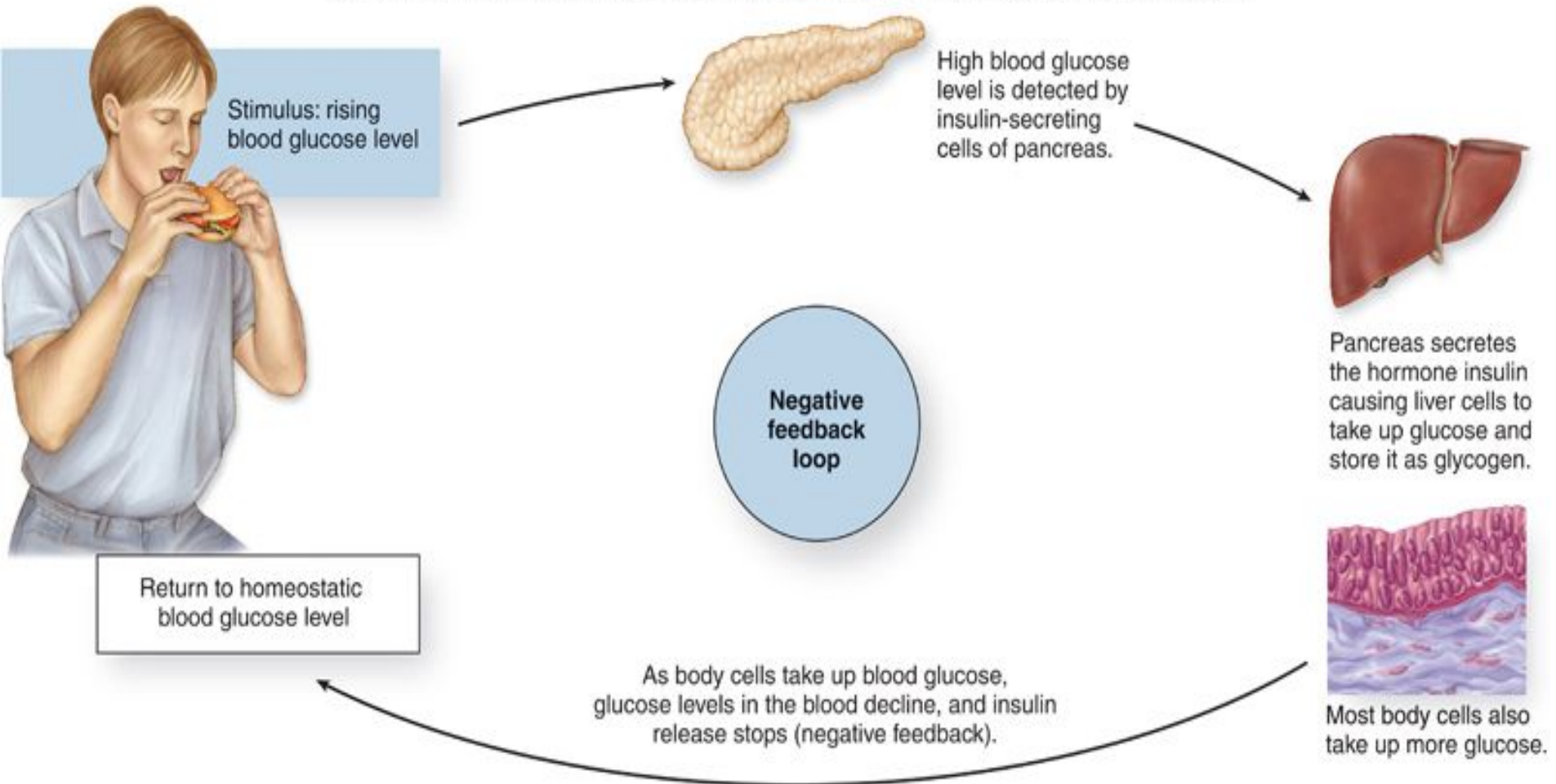
Normal blood  
glucose level.

Glucose falls  
due to exercise

Glucagon is released  
by the pancreas and  
causes glycogen in  
the liver to be  
converted back to  
glucose







What would happen if my pancreas did not produce enough insulin?



# Symptoms of Diabetes



Glucose in urine

# Thirsty



# Tiredness





People with diabetes test their blood  
to see how much glucose is in it and  
inject with insulin accordingly



Use the internet have given you to fill in the table about diabetes

| Type of diabetes | Cause | Method of control |
|------------------|-------|-------------------|
|                  |       |                   |
|                  |       |                   |

Extension: How is the insulin that is injected by diabetics produced?

# How can diabetes sufferers control their symptoms?

- Making sure that they do not eat too much sugary food
- Carry out exercise to convert excess glucose to energy
- Amount of insulin injected depends on the amount they eat and how active they are