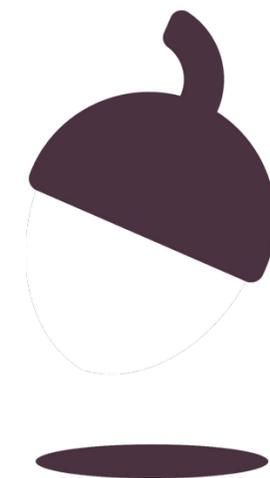


Combined Science FT- Biology - KS4  
Homeostasis and Response

# The Nervous System and Homeostasis

## Review Lesson - Foundation

Miss Ray



**OAK**  
NATIONAL  
ACADEMY

# Copy and complete

State where the receptors to each of these stimuli are found:

<u>Stimulus</u>	<u>Location of receptors</u>
Light intensity	
Temperature	
Pressure	
Sound	



# Answers

State where the receptors to each of these stimuli are found:

<u>Stimulus</u>	<u>Location of receptors</u>
Light intensity	Eyes
Temperature	Skin
Pressure	Skin
Sound	Ears





# Skin receptor density

<b>Location</b>	<b>Density (per mm<sup>2</sup>)</b>
Fingertips	5
Bicep	0.4
Thigh	0.05

1. In which location are the receptors found closest together?
2. Why are injections commonly given in the bicep or thigh?
3. The eye has a light receptor density of 8 per mm<sup>2</sup>, the fingertips have a light receptor density of 0 per mm<sup>2</sup>. What stimulus do each of these locations receive?
4. The eye also contains pressure receptors, why is this?



# Answers

1. In which location are the receptors found closest together?

**Fingertips**

2. Why are injections commonly given in the bicep or thigh?

**The receptors are less dense/more spread out in these areas. It will be less painful as less receptors will be stimulated.**



# Answers

3. The eye has a light receptor density of 8 per  $\text{mm}^2$ , the fingertips have a light receptor density of 0 per  $\text{mm}^2$ . What stimulus do each of these locations receive?

**Eye - light reflected into the eye**

**Fingertips - pressure/temperature**

4. The eye also contains pressure receptors, why is this?

**Detect when something is in the eye that could potentially cause damage  
e.g. an eyelash that has fallen into the eye.**





## Quick questions

1. Name a hormone that is secreted by the adrenal gland.
2. Name the hormone that is secreted by the thyroid gland.
3. True or false - insulin is released when blood glucose concentrations are too high.
4. True or false - glycogen is insoluble.





## Quick questions

1. Name a hormone that secreted by the adrenal gland.

**Adrenaline**

2. Name the hormone that is secreted by the thyroid gland.

**Thyroxine**

3. True or false - insulin is released when blood glucose concentrations are too high.

**True**

4. True or false - glycogen is insoluble.

**True**

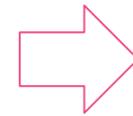




Glucose concentration increases.

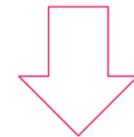


Receptors detect the change and send a signal to the coordination centre.



Response?

Conditions return to normal and responses are switched off.



Normal blood glucose concentrations



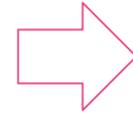
Glucose concentration increases.



Normal blood glucose concentrations



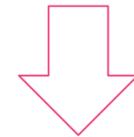
Receptors detect the change and send a signal to the coordination centre.



The pancreas releases insulin. This stimulates the liver cells to convert glucose into glycogen.



Conditions return to normal and responses are switched off.





# Exam style questions

## 1. Explain the effect an insulin injection has on the body. [4]

Insulin travels in the \_\_\_\_\_ and stimulates the \_\_\_\_\_ cells to convert \_\_\_\_\_ into \_\_\_\_\_. This reduces the blood glucose concentration.

## 2. State two differences between type 1 and type 2 diabetes [2]





# Exam style questions

## 1. Explain the effect an insulin injection has on the body. [4]

Insulin travels in the blood and stimulates the liver cells to convert glucose into glycogen. This reduces the blood glucose concentration.

## 2. State two differences between type 1 and type 2 diabetes [2]

- Type 1 caused when the pancreas does not secrete insulin, type 2 is caused by the cells no longer responding to insulin
- Type 1 is genetic, type 2 is not.
- Type 1 is often diagnosed in childhood, type 2 is often diagnosed in later life.
- Type 2 can be controlled by following a strict diet, type 1 is controlled with insulin injections.



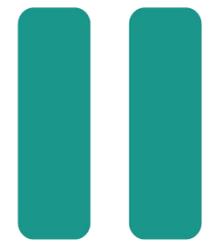


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	<b>Nervous Control</b>	<b>Hormonal control</b>
What is the signal?	Electrical	
How is it transported?		Blood stream
Where does it travel to?	Effectors (muscles or glands)	
How quick is this process?		Slow
How long does this process last?	Short lasting	
How widespread are the effects?		Effects are seen around the body





# Copy and complete



	<b>Nervous Control</b>	<b>Hormonal control</b>
What is the signal?	Electrical	<b>Chemical</b>
How is it transported?	<b>Neurones/nerve cells</b>	Blood stream
Where does it travel to?	Effectors (muscles or glands)	<b>Target cells/organs</b>
How quick is this process?	<b>Rapid</b>	Slow
How long does this process last?	Short lasting	<b>Long lasting</b>
How widespread are the effects?	<b>Localised</b>	Effects are seen around the body

