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## ***Program Support Notes***

Senior Secondary

25 mins

# **Homeostasis**

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**Suitable for:**

**Biology**

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# Homeostasis

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## For Teachers:

### Introduction

Homeostasis is an important regulatory system that allows organisms to maintain internal stability and metabolic efficiency within variable external environments. Our bodies are constantly being subjected to changes in such things as temperature, air quality, varied foods, sleep and physical exertion to name a few. This program introduces biology students to the phenomenon of homeostasis, why it is important and how it works. The mechanisms for detecting and counteracting changes are explored, along with the roles of the nervous and endocrine systems in maintaining a balance.

### Program Timeline

00:00	Introduction
01:08	Chapter 1 – What is homeostasis?
05:03	Chapter 2 – Why is homeostasis important?
08:58	Chapter 3 – Detecting changes from the stable state – Part 1
14:06	Chapter 4 – Counteracting changes from the stable state
19:13	Chapter 5 – How does homeostasis work?
23:45	Conclusion
24:17	Credits

### Website References

<http://www3.fhs.usyd.edu.au/bio/homeostasis/Introduction.htm>  
[http://www.biology-online.org/4/1\\_physiological\\_homeostasis.htm](http://www.biology-online.org/4/1_physiological_homeostasis.htm)  
[http://www.discover.tased.edu.au/openit/science\\_simulations/homeolinks.html](http://www.discover.tased.edu.au/openit/science_simulations/homeolinks.html)

### Other Relevant Programs available from VEA

Science Bank Series - Homeostasis  
Human Body in Action Series – Immune System

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## Student Worksheet:

### **Before Viewing the Program**

1. Give your definition of the word *homeostasis*.
2. Briefly explain why you think your body responds in specific ways to different external conditions, such as sweating in the heat or shivering in the cold.
3. In biological terms, briefly explain why you think it is important for many animals and plants to maintain a fairly constant internal environment.
4. List as many examples as you can of the internal physical and chemical conditions that you think humans would need to keep fairly constant in order to remain healthy.

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## While Viewing the Program

1. What is the origin and literal meaning for the word *homeostasis*?

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2. *Complete the sentence:*

In biological terms, homeostasis refers to the ability of organisms to \_\_\_\_\_  
\_\_\_\_\_ despite variations in  
external conditions.

3. What is the constant level of an organism's internal environment known as?

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4. *Fill in the blanks:*

Homeostasis mechanisms help to maintain within narrow limits such things as:

- Blood \_\_\_\_\_ and \_\_\_\_\_
- \_\_\_\_\_ / \_\_\_\_\_ balance
- \_\_\_\_\_ and \_\_\_\_\_ concentrations
- Blood \_\_\_\_\_
- Body \_\_\_\_\_

5. What are some of the body systems maintained by homeostasis?

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6. What is the biochemical trigger for breathing in animals such as humans?

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7. What do enzymes do for chemical reactions within the body?

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8. What can changes in internal conditions (such as pH) do to enzymes?

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9. What is the collective name for the parts of an organism that detect external and internal stimuli?

\_\_\_\_\_

10. List the five external receptors of the human body.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. What is the collective name for the parts of an organism that carry out homeostatic responses?

\_\_\_\_\_

**12. Complete the sentence:**

The two types of pathways for homeostatic responses are n \_\_\_\_\_ and  
h \_\_\_\_\_

**13. Complete the sentence:**

The \_\_\_\_\_ is the control centre for homeostasis and is linked to  
the endocrine system via the \_\_\_\_\_ gland.

14. What is the term that relates to a homeostatic response that ultimately negates (reverses) a change in internal or external conditions?

\_\_\_\_\_

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## *After Viewing the Program*

1. Investigate the information provided about homeostasis via the three website links under “Useful Resources”.
2. In small groups, design a poster illustrating a stimulus-response pathway for an external or internal stimulus of your choice.
3. In small groups, design a poster illustrating an example of negative feedback.
4. As a group, discuss, design and act out a role-play of a stimulus-response pathway, with members representing the physical and/or chemical factors involved.
5. In small groups, design your own games of “hangman” based on words related to homeostasis and play on the board with the rest of the class.