

Student’s Learning Activities (Lavoisier and respiration)

Activity 1

You will watch a video with narration or listen to a story from your teacher about Lavoisier and respiration. Please write the most important points of the story according to your view and discuss them in your group (Indicative points of the story: description of Lavoisier’s experiment on human respiration, the importance of the scientific understanding about the correlation between the respiration, the hydrogen and the produced heat of the animals,...)

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Activity 2

Based on the narration, please describe the Lavoisier’s experiment on human respiration. For the accurate description you can use the proposed websites:

- <http://www.chemeddl.org/alfresco/d/d/workspace/SpacesStore/3ed11d71-3c12-4b91-822f-b7f8516d9896/V04N03P25.pdf?guest=true>
- <http://sceti.library.upenn.edu/sceti/smith/zoom.cfm?PictureID=2304&level=1>

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Activity 3

Based on the narration you have heard and the following text, please discuss in your group the conclusions of the experiment of Lavoisier¹ about the human respiration:

“Lavoisier measured the amount of gas Séguin used, the rate of his breathing, and his pulse over the course of an hour. The level of the consumed oxygen varied depending on his activities: he needed three times more oxygen while exercising as when resting, more when eating than fasting, and more when sitting in a cold room than in a warm one. His pulse and breathing rate varied too”.

Activity 4

Please research in the internet for the proper information and write a text about the human respiration, according to the current scientific views.

(Proposed indicative resources:

<http://digitalschool.minedu.gov.gr/modules/ebook/show.php/DSGYM-A103/369/2465,9421/>

<http://el.wikipedia.org/wiki/%CE%91%CE%BD%CE%B1%CF%80%CE%BD%CE%B5%CF%85%CF%83%CF%84%CE%B9%CE%BA%CF%8C%CF%83%CF%8D%CF%83%CF%84%CE%B7%CE%BC%CE%B1#.CE.97.CE.BB.CE.B5.CE.B9.CF.84.CE.BF.CF.85.CF.81.CE.B3.CE.AF.CE.B1.CF.84.CE.B7.CF.82.CE.B1.CE.BD.CE.B1.CF.80.CE.BD.CE.BF.CE.AE.CF.82>)

<http://www.youtube.com/watch?v=Lo74zm3ULyk>

<http://www.youtube.com/watch?v=27Tn7rD3e3I>

¹Karamanou, M. Tsoukalas, G. & Androustos, G. (2013). Hallmarks in the study of the respiratory physiology and the crucial role of the Antoine- Laurent de Lavoisier (1743-1794), *AM J Physiol Lung Cell Mol Physiol*, First published on September 13.

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Activity 5

Using the following list of ideas that describe the characteristics of science as well as the ways it develops, which scientists call “Nature of Science” (NOS) try to locate some of them in the story you heard and the above activities of this lesson. McComas (2004).

Characteristics of Nature of Science (NOS)

1. Science demands and relies on empirical evidence.
2. Knowledge production in science includes many common features and shared habits of mind.
3. Scientific knowledge is tentative but durable.
4. Laws and theories are related but distinct kinds of scientific knowledge.
5. Science is a highly creative endeavor.
6. Science has a subjective element.
7. There are historical, cultural, and social influences on science.
8. Science and technology impact each other, but they are not the same.
9. Science and its methods cannot answer all questions.

Scientists argue that in order to learn science one must first understand what exactly science is. Because it is difficult to define science, scientists give a list of its characteristics.

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Student's Learning Activities (Lavoisier and respiration) were written by Aikaterini Rizaki and Panagiotis Kokkotas with the support by the European Commission (project 518094-LLP-1-2011-1-GR-COMENIUS-CMP) and the NKUA of Greece. This publication reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained there in.