

Pulse Oximeter Lab

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Everest Pulse Oximeter Test Results

In the spring of 1997, climbers David Breashears, David Carter, and Ed Viesturs agreed to undergo physiological and psychometric testing from Base Camp to the summit. Below is the data on the physiological testing. SaO₂ refers to oxygen saturation - the percentage of oxygen in arterial blood. At sea level this is generally between 97 and 99%. SaO₂ levels and pulse were measured with a small device called a pulse oximeter that is attached to the fingertip and takes measurements by shining red and infrared light through the finger tissue.

Fill in the missing information:

(from website, about 1/3 of the way down the page)

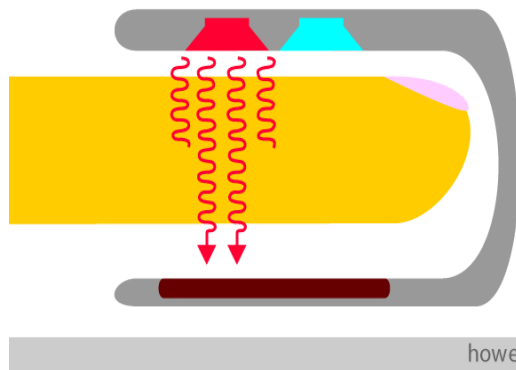
http://www.howequipmentworks.com/physics/respi_measurements/oxygen/oximeter/pulse_oximeter.html

Oxygen Saturation tells you the percentage of _____

The pulse oximeter uses two lights to analyze hemoglobin. One is a _____ light, with a wavelength of _____ nm. The other is an _____ light, with a wavelength of _____ nm.

Oxygenated hemoglobin absorbs more _____ light.

and deoxyhemoglobin absorbs more _____ light.



Question: When is there more oxygen in your bloodstream- when your pulse is high or low?

Hypothesis: Write a hypothesis statement that answers the Question above.

Procedure: You are going to use the class pulse oximeter to measure your SaO₂ level with a low pulse and a high pulse and compare the two readings.

What are some things you can do in the classroom to make sure your pulse is low?

What are some things you can do in the classroom to ensure you have a high pulse rate (gets your heart beating faster)?

When it is your turn to use the pulse oximeter, take a reading when you have been quiet and inactive for a few minutes, then take again when you have done something physical to get your heart rate up.

Data:

Activity level	Pulse (bpm)	SaO ₂ (%)
Quiet, inactive		
Very active		

Analysis:

Which of your O₂ levels was highest: (complete sentence please, with numbers).

Date _____

Conclusion: What do you think the answer to the question is now?
(sentence) Was your hypothesis accepted or rejected?

Everest Data: Get a sheet of data from one of the 3 climbers who climbed Everest in 1997. Glue your data here: Graph the percentage of oxygen (SaO₂) vs elevation for your climber on the next page. What does your graph show?

climber data available at

<http://www.pbs.org/wgbh/nova/everest/expeditions/97/testresults.html>