Respiratory Physiology
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- How do we breathe?
- What does a person need for breathing?
Respiratory Physiology

Respiratory organs

- Nose
- Mouth
- Trachea
- Primary bronchus
- Bronchiol tree
- Lungs
- Nasal cavity
- Throat
- Larynx
- Alveoli (air cells)

Alveoli appr. 300 millions
Surface available for gas exchange 70-100 m²
Breathing enables the necessary exchange of CO₂ and O₂ in the blood circulation.

The gas exchange takes place in the alveoli, i.e. the carbon dioxide is washed out and the venous blood is enriched with oxygen.
**Respiratory Physiology**

Composition of inhaled and exhaled air

<table>
<thead>
<tr>
<th></th>
<th>Inhalation</th>
<th>Exhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen</td>
<td>21%</td>
<td>17%</td>
</tr>
<tr>
<td>Carbon dioxide</td>
<td>0.04%</td>
<td>4.04%</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>78 %</td>
<td>78 %</td>
</tr>
<tr>
<td>Noble gases</td>
<td>0.96%</td>
<td>0.96%</td>
</tr>
</tbody>
</table>

The result:
Approximately 4% oxygen from the ambient air are consumed. And approximately 4% CO$_2$ are exhaled to the ambient air. Nitrogen or other noble gases are not taken up by the blood and exhaled.
A lack of oxygen is the greatest danger for human life:

Humans are able to survive

• 7 days without food,

• 3 days without liquid,

⇒ but: only 3 minutes without oxygen.
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