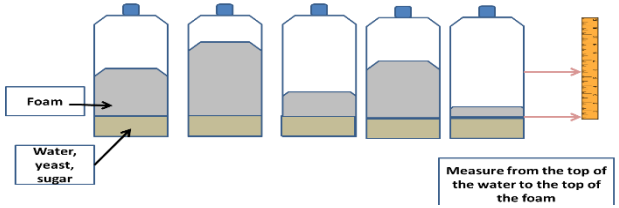
Year 8 Knowledge Organiser – Respiration

Key words:
Aerobic Using oxygen
Anaerobic Not using oxygen
Oxidation A reaction with oxygen. In this case, food molecules like glucose reacting with oxygen.
Fatigue Tiredness. In muscles is caused by a build-up of lactic acid, which is produced during anaerobic respiration.
Oxygen debt After exercise, the lactic acid has built up and caused an extra need for oxygen – called the oxygen debt.

Key difference

Respiration is a chemical reaction that happens in all living cells. It releases **energy** from glucose.
This energy allows all the other processes that keep us alive to happen.
It is **not** the same as breathing. **Breathing** is the movement of your lungs that brings in the oxygen for respiration and gets rid of the carbon dioxide produced.

How can we measure the rate of respiration?



When yeast cells respire aerobically they produce carbon dioxide which creates a foam. We can measure the height of the foam produced in a certain time to give us an indication of how fast they are respiring.

Equation for aerobic respiration

glucose + oxygen → water + carbon dioxide + energy
$C_6H_{12}O_6 + O_2 \rightarrow H_2O + CO_2 + ATP$

Equation for anaerobic respiration

glucose → lactic acid + energy
$C_6H_{12}O_6 \rightarrow C_3H_6O_3 + ATP$

The Response To Exercise.

During exercise, more energy is required by the body than when resting, due to increased muscle contractions. The body reacts to this increased demand for energy by:

- **The heart rate, breathing rate, and volume of each breath all increase.**
- Together, these increase the amount of oxygenated blood reaching the muscles.
- The **oxygenated blood provides the extra oxygen and glucose** needed for respiration in muscle cells, to release more energy to meet demand.

Websites that might be useful:
https://www.bbc.com/bitesize/guides/zq349j6/revision/1

https://www.bbc.com/bitesize/articles/zth9ng8

https://www.bbc.com/bitesize/articles/zcsbmsg
Extension ideas to research:
Why are some people better at sprinting than others?
How can you improve your endurance?