Respiration (Biology 8th Grade) Cheat Sheet

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Definitions

Breathing -> Process of taking oxygen and releasing carbon dioxide	Respiration -> Process of using oxygen to release glucose
Ventilation -> Movement of air into and out of the lungs	Scientific Inquiry -> Process of testing ideas and making hypothesis

Aerobic & Anaerobic

Aerobic -> Biochemical process that uses oxygen to convert glucose into energy, producing carbon dioxide & water as byproducts	Anaerobic -> Occured in exercising, enabling muscles to generate energy
$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + 36ATP$	$C_6H_{12}O_6 \rightarrow 2C_3H_6O_3 + 2ATP$
Oxygen + Glucose -> Carbon Dioxide + Water + Energy	Glucose -> Lactic Acid + Some Energy

- Aerobic requires oxygen and produces more energy & non-toxic byproducts (CO_2 & Water)
- Anaerobic results in lactic acid and less energy

Exercising

Sports training strengthens the muscles involved in breathing, allowing the lungs to expand more efficiently.	The lungs can become larger with regular training, enabling more air (and thus more oxygen) to be taken in during each breath.
With stronger respiratory muscles and larger lungs, more oxygen can enter the bloodstream during respiration.	Training increases the number of capillaries in the lungs, which improves the exchange of gases (oxygen and carbon dioxide) between the lungs and blood.

Fitter individuals return to their normal breathing rate more quickly after exercise, showing more efficient respiratory response.

The Process of Muscles in Breathing

Inhalation -> The diaphragm contracts and moves downward while the intercostal muscles between the ribs contract, lifting the rib cage up and outward. This increases the volume of the thoracic cavity and decreases the air pressure inside the lungs, allowing air to flow in.	Exhalation -> The diaphragm relaxes and moves upward, and the intercostal muscles relax, letting the rib cage move down and in. This decreases the volume of the thoracic cavity, increases the pressure in the lungs, and pushes air out.

Functions in Respiration System

Pattern: Nose -> Trachea (Windpipe) ->Bronchus -> Lungs -> Bronchioles -> Alveolus	Nose -> Filters, warms, and moistens the air before it enters the respiratory system.
Trachea -> Serves as the main airway that carries air to and from the lungs.	Bronchus -> Directs air into each lung.
Lungs -> Main organs of respiration where gas exchange takes place.	Bronchioles -> Small air passages that distribute air evenly within the lungs.
Alveolus -> Tiny air sac where oxygen and carbon dioxide are exchanged between the lungs and blood.	Mucus -> Traps dust, pathogens, and other particles to protect the respiratory tract.
Cilia -> Tiny hair-like structures that move mucus and trapped particles out of the respiratory system.	Capillary Wall -> Allow the diffusion of oxygen and carbon dioxide between the blood and alveoli.

Range & Mean

Range -> Highest to Lowest	Mean = (Sum of all values) ÷ (Number of values)

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