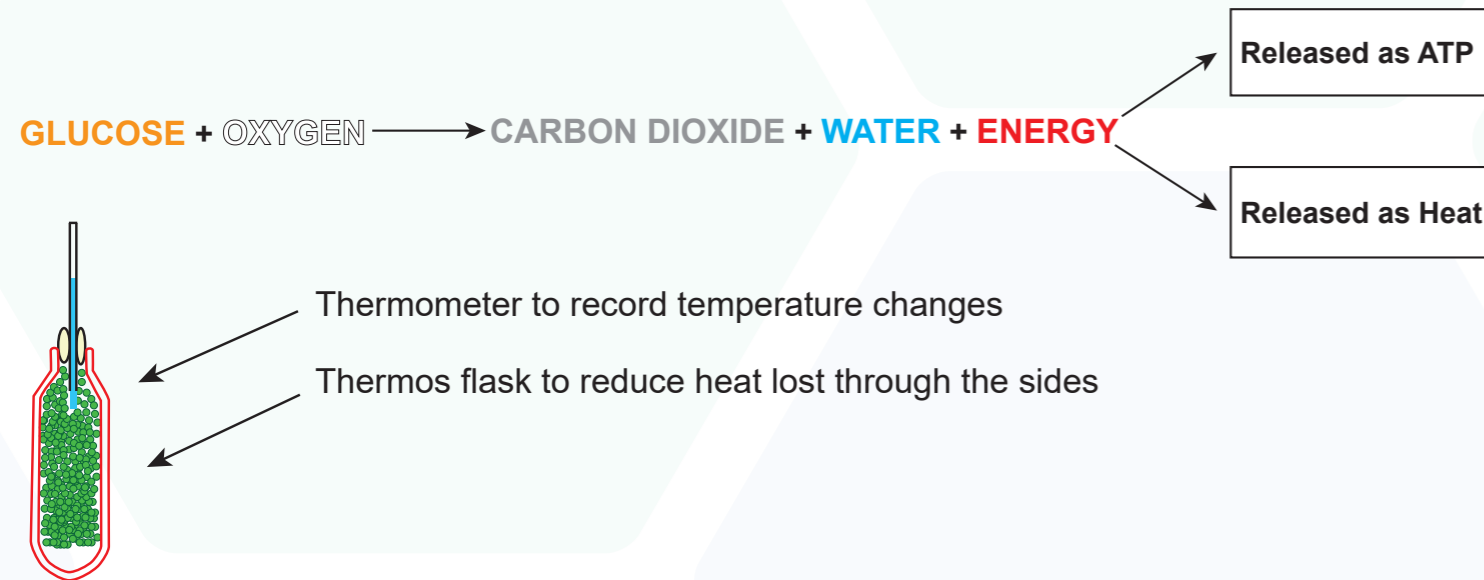


## Aerobic respiration

A series of **enzyme-controlled** chemical reactions in the mitochondria of cells. Blood carries **glucose and oxygen** to the cells, they **diffuse** in and react releasing the stored energy from the glucose.

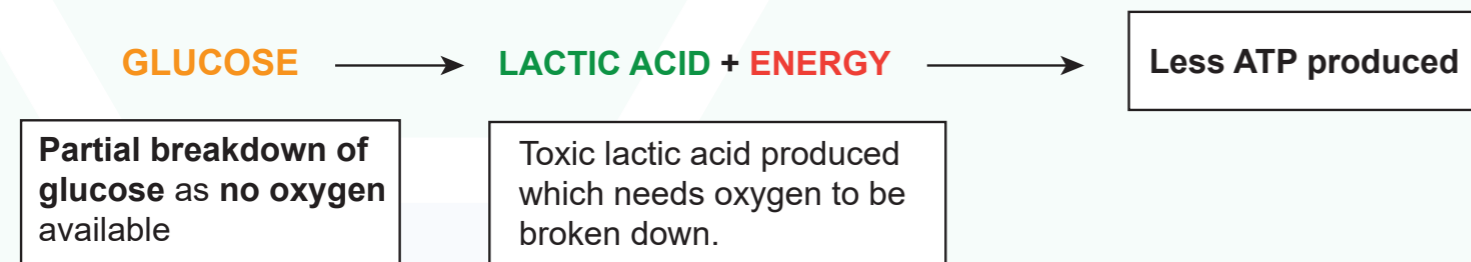


### Investigating respiration in germinating peas

- 1 Peas respire releasing heat and recorded temperature goes up.
- 2 Peas are boiled (respiratory enzymes are denatured) no respiration by peas but recorded temperature still increases slightly as peas are covered in respiring microbes.
- 3 Boiled and disinfected peas. Temperature does not increase as no respiration occurs.

## Anaerobic respiration

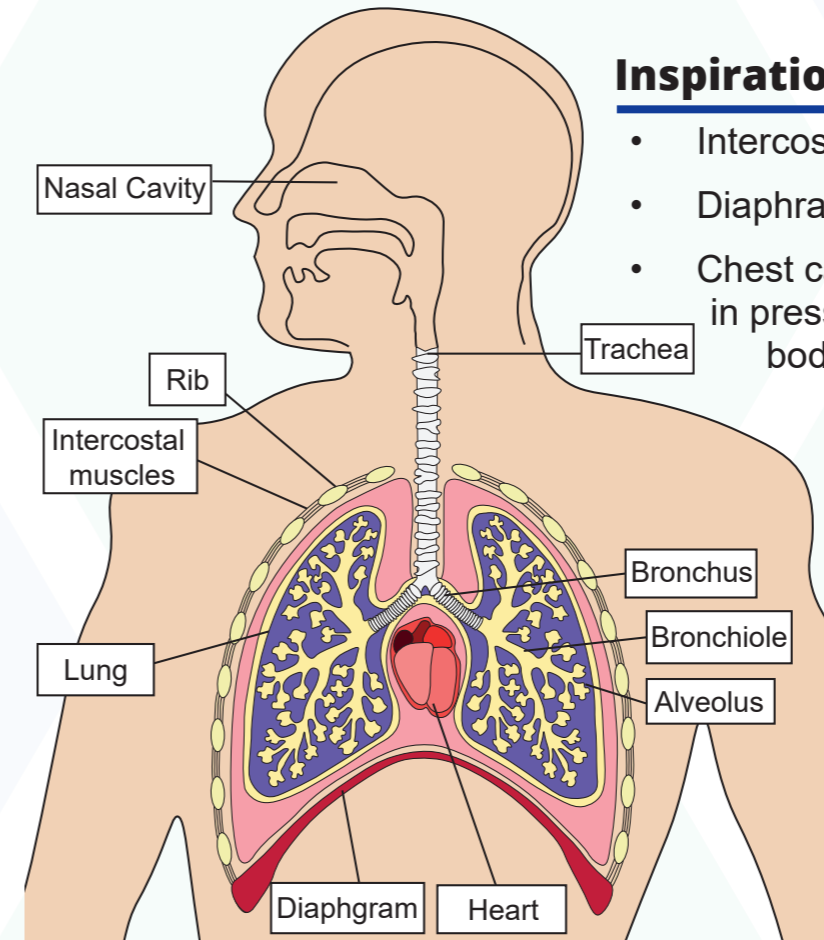
A **shorter series of enzyme-controlled reactions** that partially breaks down glucose releasing only some of the energy stored. This reaction can occur in the **absence of oxygen**.



The amount of oxygen needed to remove the toxic lactic acid is the **oxygen debt** and must be paid back when oxygen is readily available.

## The respiratory system

The function of the respiratory system is to obtain sufficient oxygen for respiration and to remove the equivalent volume of waste gases carbon dioxide and water.



### Inspiration

- Intercostal muscles contract lifting ribs up and out
- Diaphragm contracts and flattens
- Chest cavity increases in volume and decreases in pressure below the pressure outside the body and so air is sucked in to equalize the pressure.

### Expiration

- Intercostal muscles relax and ribs move down and in.
- Diaphragm relaxes and domes up.
- Chest cavity decreases in volume and increases in pressure, air is forced out.

## Gas exchange

The alveoli are adapted for gas exchange by:

- Good blood supply
- Large surface area
- Thin walls
- Moist lining

As the red blood cells and plasma in the blood capillary flow around the alveolus oxygen diffuses into the capillary and carbon dioxide diffuses out.

