**Topic 2.8: Cell Respiration**

**Essential Idea: Cell respiration supplies energy for the functions of life.**

**Statements & Objectives:**

**2.8.U1 Cell respiration is the controlled release of energy from organic compounds to produce ATP.**

​Define “cell respiration.”

**Define**: Give the precise meaning of a word, phrase, or physical quantity.)

State the reaction for cellular respiration.

**(State**: Give a specific name, value or other brief answer without explanation or calculation)

State the types of organic compounds used in cellular respiration by animals and plants.

**(State**: Give a specific name, value or other brief answer without explanation or calculation)

**2.8.U2 ATP from cell respiration is immediately available as a source of energy in the cell.**

State three example uses of cellular energy.

**(State**: Give a specific name, value or other brief answer without explanation or calculation)

Outline energy transfer in the formation and use of ATP.

​**(Outline**: Give a brief account or summary)

State three reasons why cellular respiration must be continuously performed by all cells.

**(State**: Give a specific name, value or other brief answer without explanation or calculation)

**2.8.U3 Anaerobic cell respiration gives a small yield of ATP from glucose.**

​Define “anaerobic respiration”

**Define**: Give the precise meaning of a word, phrase, or physical quantity.)

List three situations in which anaerobic respiration is useful.

**(List:** Give a sequence of brief answers with no explanation).

Compare anaerobic respiration in yeasts and humans.

**Compare:** Give an account of similarities and differences between two (or more) items, referring to both (all) of them throughout.)

**2.8.U4 Aerobic cell respiration requires oxygen and gives a large yield of ATP from glucose.**

Compare the total amount of ATP made from anaerobic and aerobic respiration.

**Compare:** Give an account of similarities and differences between two (or more) items, referring to both (all) of them throughout.)

​State the location of aerobic respiration.

**(State**: Give a specific name, value or other brief answer without explanation or calculation)

**2.8.A1 Use of anaerobic cell respiration in yeasts to produce ethanol and carbon dioxide in baking.​**

Outline how anaerobic respiration in yeast is used in baking.

​**(Outline**: Give a brief account or summary)

Outline how anaerobic respiration in yeast is used in ethanol production.

​**(Outline**: Give a brief account or summary)

**2.8.A2 Lactate production in humans when anaerobic respiration is used to maximize the power of muscle contractions.**

State the condition in which humans would perform anaerobic respiration.

**(State**: Give a specific name, value or other brief answer without explanation or calculation)

​Outline production of lactate in humans during anaerobic respiration.

​**(Outline**: Give a brief account or summary)

**2.8.S1 Analysis of results from experiments involving measurement of respiration rates in germinating seeds or invertebrates using a respirometer.**

Outline the use of a respirometer to measure cellular respiration rate.

​**(Outline**: Give a brief account or summary)

**2.8.NOS Assessing the ethics of scientific research- the use of invertebrates in respirometers experiments.**

List ethical questions that must be considered before using animals in experiments.

**(List:** Give a sequence of brief answers with no explanation).

**Key Terms**

anaerobic respiration

covalent bond

fermentation

metabolize

​energy transfer

​respirometer

carbon dioxide

aerobic respiration

oxidation

alcoholic

Kreb Cycle

​Yeast

​germination

​heat

phosphate

pyruvate

catalyze

lactic acid

acetyl-CoA

​ethanol

mitochondria

glycolysis

ethanol

organic compounds

​lactate

​glucose

ATP

​ADP

glucose

yeast

cell respiration

muscle contractions