**Cellular Respiration Guided Notes**

1. Two types of Cellular Respiration:
   * **Aerobic** = needs \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Examples: mammals, trees, bacteria
   * **Anaerobic**-does **NOT** need \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Examples: tetanus, and botulism

Obligate anaerobes = **must** have \_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_

Example: Clostridium and methane-producing archaea (ancient bacteria)

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is broken down for energy - **ATP**!! What do cells need ATP for?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Two different metabolic pathways – begin in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: A.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (anaerobic)

B. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cellular respiration. Moves into mitochondria Mitochondria = energy organelle!!

1. In fermentation reactions:

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is incompletely broken down
* Some energy remains in resulting molecule
* 2 \_\_\_\_\_\_\_\_\_\_ produced
* 2 types: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Both anaerobic

1. **Alcoholic Fermentation** occurs in yeast - Glucose 🡪 carbon dioxide & ethanol

**Fermentation: C6H12O6 🡪 2CO2 + C2H5OH plus 2 ATP**

Yeast cells do alcoholic fermentation. In wine and beer industry – ferment carbohydrates in fruits and grains to produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_. In baking, \_\_\_\_\_\_\_\_\_\_\_causes bread to rise.

1. **Lactic Acid Fermentation:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and some microbes produce \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_. Ex. Yogurt, cheese, sourdough bread. Muscle fatigue is due to build up of lactic acid in muscles.
2. **Aerobic Cellular Respiration:**

* ­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ completely broken down to inorganic molecules
* More chemical ­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ converted to **ATP**

Glucose + oxygen 🡪 carbon dioxide + water

**C6H12O6 + 6O2  🡪 6CO2 + 6H2O** **plus 36 ATP** Note – oxygen required!!

1. Final steps of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cellular respiration occur in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. 36 ATP produced.

|  |  |
| --- | --- |
| **Pathway** | **ATP** |
| Fermentation | 2 |
| Aerobic respiration | 36 |

1. How much \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (ATP) is produced during \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

* Anaerobic Respiration – \_\_\_\_\_\_\_\_\_ ATP
* Aerobic Respiration – \_\_\_\_\_\_\_\_\_\_ ATP
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is more efficient!**

C6H12O6 + 6O2  🡪 6CO2 + 6H20

Cellular \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is how cells get ATP from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!

**Glucose 🡪 cellular respiration 🡪 ATP**

1. How does the formula for **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** compare to the formula for **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** ?

Photosynthesis

**6CO2 + 6H2O 🡪 C6H12O6 + 6O2**

Cellular Respiration:

**C6H12O6 + 6O2  🡪 6CO2 + 6H2O**

|  |  |
| --- | --- |
| **Photosynthesis** | **Cellular Respiration** |
| Food (glucose) is made | Food (glucose) is broken down |
| Energy from the Sun stored in Glucose | Energy of Glucose Released as ATP |
| CO2 taken in | CO2 given off |
| Oxygen given off | Oxygen taken in |
| Occurs in plants | Occurs in plants and animals |