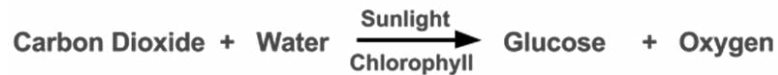


# Year 10 Trilogy Biology 4: Bioenergetics Knowledge Organiser

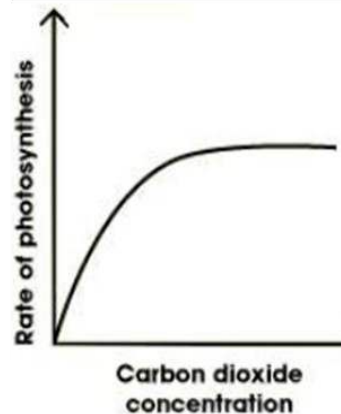
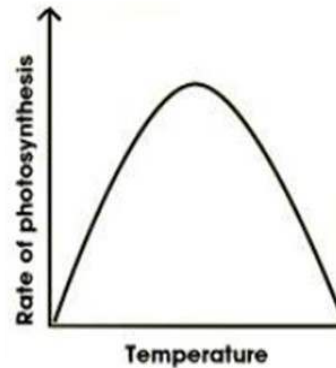
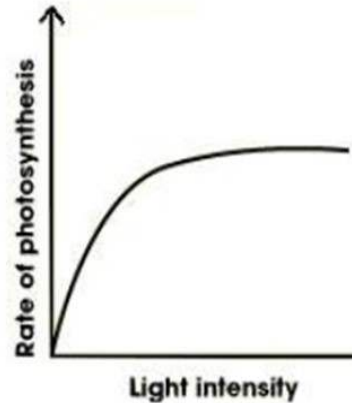
## 1. Photosynthesis



|                 |   |
|-----------------|---|
| Photosynthesis  | An endothermic reaction where sunlight is absorbed and used to convert carbon dioxide and water into glucose and oxygen |
| Uses of glucose | •Respiration •Converted into starch •Produce fat or oil •Produce cellulose cell walls •Produce amino                    |

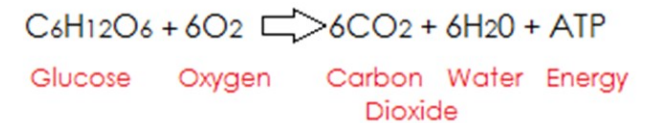
## 2. Rate of photosynthesis

| Factor                | Affect on photosynthesis                         | Reason  |
|-----------------------|--|---|
| Light                 | Increases  | More energy for the reaction                            |
| Carbon dioxide        | Increases  | More reactants (provided there is no limiting reactant) |
| Amount of chlorophyll | Increases  | More energy for the reaction                            |
| Temperature           | Increases then decreases                         | Initially more energy but then enzyme denatures         |
| Limiting factor       | The factor that can limit the rate of a reaction |   |



## 3. Aerobic respiration

|             |   |
|-------------|---|
| Respiration | An exothermic reaction which continuously happens in living cells |
| Purpose     | Transfer energy for:<br>•Chemical reactions •Movement •Warmth     |
| Aerobic     | With oxygen   |



|   |  |
|---|--|
| Anaerobic   | Without oxygen   |
| Anaerobic respiration in muscle cells               | glucose → lactic acid  |
| Anaerobic respiration in yeast cells (fermentation) | glucose → ethanol + carbon dioxide   |
| Lactic acid   | A chemical that when built up in muscles causes fatigue                      |
| Oxygen debt HT ONLY                                 | The amount of oxygen the body needs after exercise to remove the lactic acid |

## 4. Metabolism

|            |   |
|------------|---|
| Metabolism | The sum of all the reactions in a cell or the body  |
| Includes:  | •Conversion of glucose to starch, glycogen and cellulose •Formation of lipids from glycerol and 3 fatty acids •Use of glucose and nitrates to make proteins (PLANTS) •Respiration •Breakdown of protein |