|  |  |  |  |
| --- | --- | --- | --- |
| **Photosynthesis** | **The process of converting light energy into stored chemical energy.** | **Respiration** | **The process of converting glucose into usable energy.** |
| Chloroplast | The site of photosynthesis in a plant cell. | Mitochondrion/Mitochondria | The site of respiration – the cell’s energy factories. |
| Chlorophyll | The green pigment which absorbs energy from light. | Cristae | The inner membrane foldings of a mitochondrion ( for electron transport chain). |
| Thylakoid membrane | Membrane containing chlorophyll. | Matrix | Fluid-filled space inside mitochondrion where Kreb’s cycle occurs. |
| Grana | Stacks of thylakoid membranes | ATP | The energy currency of living things – Adenosine Tri-Phosphate. |
| Calvin cycle | The carbon-fixing, light-independent phase of photosynthesis occurring in the stroma. | Aerobic vs. anaerobic | Occurring with or without oxygen. Respiration is less efficient anaerobically. |
| **Transport in Cells** | **How substances move in and out of cells.** | Kreb’s cycle | Enzyme-controlled reactions in the matrix which releases CO2 and pass on H+. |
| Diffusion | The passive movement of molecules from areas of high to low concentration. | **Cell Structure** | **The physical parts of a cell.** |
| Osmosis | Diffusion of water (high🡪low conc.) across a semi-permeable membrane.  | Organelles | The cellular structures inside a cell which perform different functions. |
| Endocytosis | Material being engulfed by a cell (phagocytosis or pinosytosis). | Lysosomes | Sacs carrying enzymes to break down foreign materials. |
| Passive transport | No energy required to move molecules in or out of cell. | Plasma membrane | A lipid bilayer surrounding the cell. |
| Ion pump | Use energy (active transport) to move molecules against concentration gradient. | Guard cells | A pair of cells which can close to prevent water loss in leaves by evaporation. |
| Exocytosis | The release of vesicle contents to the outside of the cell. | Stoma/Stomata | A pore/Pores which allow gases to move in and out of a leaf. |
| **Enzymes** | **Proteins which catalyse (speed up) chemical reactions.** | Cell wall | A semi-rigid structure outside the plasma membrane which gives plant cells shape. |
| Active site | The site where substrate molecules are to be wither joined or broken up. | Golgi apparatus | Produces lysosymes. Stores and modifies proteins and tags their destination. |
| Denaturing | Enzymes which have changed shape and are non-functional from too much heat. | Endoplasmic reticulum | Network of tubules throughout cell. Rough ER is where proteins are synthesized. |
| Anabolic | An enzyme which brings multiple substrate molecules together as one new molecule. | Cytoplasm | The water solution inside the cell. |
| Catabolic | An enzyme which breaks a single molecule down into multiple smaller molecules. | Nucleus | The control centre of a cell, contains the DNA. |

And now a page break – for 9 kids print both pages

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| --- | --- | --- | --- | --- |
| **Photosynthesis** | **Respiration** | **Photosynthesis** | **Respiration** | **Photosynthesis** |
| Chloroplast | Mitochondrion/Mitochondria | Chloroplast | Mitochondrion/Mitochondria | Chloroplast |
| Chlorophyll | Cristae | Chlorophyll | Cristae | Chlorophyll |
| Thylakoid membrane | Matrix | Thylakoid membrane | Matrix | Thylakoid membrane |
| Grana | ATP | Grana | ATP | Grana |
| Calvin cycle | Aerobic vs. anaerobic | Calvin cycle | Aerobic vs. anaerobic | Calvin cycle |
| **Transport in Cells** | Kreb’s cycle | **Transport in Cells** | Kreb’s cycle | **Transport in Cells** |
| Diffusion | **Cell Structure** | Diffusion | **Cell Structure** | Diffusion |
| Osmosis | Organelles | Osmosis | Organelles | Osmosis |
| Endocytosis | Lysosomes | Endocytosis | Lysosomes | Endocytosis |
| Passive transport | Plasma membrane | Passive transport | Plasma membrane | Passive transport |
| Ion pump | Guard cells | Ion pump | Guard cells | Ion pump |
| Exocytosis | Stoma/Stomata | Exocytosis | Stoma/Stomata | Exocytosis |
| **Enzymes** | Cell wall | **Enzymes** | Cell wall | **Enzymes** |
| Active site | Golgi apparatus | Active site | Golgi apparatus | Active site |
| Denaturing | Endoplasmic reticulum | Denaturing | Endoplasmic reticulum | Denaturing |
| Anabolic | Cytoplasm | Anabolic | Cytoplasm | Anabolic |
| Catabolic | Nucleus | Catabolic | Nucleus | Catabolic |
| **Photosynthesis** | **Respiration** | **Photosynthesis** | **Respiration** | **Respiration** |
| Chloroplast | Mitochondrion/Mitochondria | Chloroplast | Mitochondrion/Mitochondria | Mitochondrion/Mitochondria |
| Chlorophyll | Cristae | Chlorophyll | Cristae | Cristae |
| Thylakoid membrane | Matrix | Thylakoid membrane | Matrix | Matrix |
| Grana | ATP | Grana | ATP | ATP |
| Calvin cycle | Aerobic vs. anaerobic | Calvin cycle | Aerobic vs. anaerobic | Aerobic vs. anaerobic |
| **Transport in Cells** | Kreb’s cycle | **Transport in Cells** | Kreb’s cycle | Kreb’s cycle |
| Diffusion | **Cell Structure** | Diffusion | **Cell Structure** | **Cell Structure** |
| Osmosis | Organelles | Osmosis | Organelles | Organelles |
| Endocytosis | Lysosomes | Endocytosis | Lysosomes | Lysosomes |
| Passive transport | Plasma membrane | Passive transport | Plasma membrane | Plasma membrane |
| Ion pump | Guard cells | Ion pump | Guard cells | Guard cells |
| Exocytosis | Stoma/Stomata | Exocytosis | Stoma/Stomata | Stoma/Stomata |
| **Enzymes** | Cell wall | **Enzymes** | Cell wall | Cell wall |
| Active site | Golgi apparatus | Active site | Golgi apparatus | Golgi apparatus |
| Denaturing | Endoplasmic reticulum | Denaturing | Endoplasmic reticulum | Endoplasmic reticulum |
| Anabolic | Cytoplasm | Anabolic | Cytoplasm | Cytoplasm |
| Catabolic | Nucleus | Catabolic | Nucleus | Nucleus |

And now another page break, for 9 kids print each page twice

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| --- | --- | --- |
| **The process of converting light energy into stored chemical energy.** | **The process of converting glucose into usable energy.** | **The process of converting light energy into stored chemical energy.** |
| The site of photosynthesis in a plant cell. | The site of respiration – the cell’s energy factories. | The site of photosynthesis in a plant cell. |
| The green pigment which absorbs energy from light. | The inner membrane foldings of a mitochondrion ( for electron transport chain). | The green pigment which absorbs energy from light. |
| Membrane containing chlorophyll. | Fluid-filled space inside mitochondrion where Kreb’s cycle occurs. | Membrane containing chlorophyll. |
| Stacks of thylakoid membranes | The energy currency of living things – Adenosine Tri-Phosphate. | Stacks of thylakoid membranes |
| The carbon-fixing, light-independent phase of photosynthesis occurring in the stroma. | Occurring with or without oxygen. Respiration is less efficient anaerobically. | The carbon-fixing, light-independent phase of photosynthesis occurring in the stroma. |
| **How substances move in and out of cells.** | Enzyme-controlled reactions in the matrix which releases CO2 and pass on H+. | **How substances move in and out of cells.** |
| The passive movement of molecules from areas of high to low concentration. | **The physical parts of a cell.** | The passive movement of molecules from areas of high to low concentration. |
| Diffusion of water (high🡪low conc.) across a semi-permeable membrane.  | The cellular structures inside a cell which perform different functions. | Diffusion of water (high🡪low conc.) across a semi-permeable membrane.  |
| Material being engulfed by a cell (phagocytosis or pinosytosis). | Sacs carrying enzymes to break down foreign materials. | Material being engulfed by a cell (phagocytosis or pinosytosis). |
| No energy required to move molecules in or out of cell. | A lipid bilayer surrounding the cell. | No energy required to move molecules in or out of cell. |
| Use energy (active transport) to move molecules against concentration gradient. | A pair of cells which can close to prevent water loss in leaves by evaporation. | Use energy (active transport) to move molecules against concentration gradient. |
| The release of vesicle contents to the outside of the cell. | A pore/Pores which allow gases to move in and out of a leaf. | The release of vesicle contents to the outside of the cell. |
| **Proteins which catalyse (speed up) chemical reactions.** | A semi-rigid structure outside the plasma membrane which gives plant cells shape. | **Proteins which catalyse (speed up) chemical reactions.** |
| The site where substrate molecules are to be wither joined or broken up. | Produces lysosymes. Stores and modifies proteins and tags their destination. | The site where substrate molecules are to be wither joined or broken up. |
| Enzymes which have changed shape and are non-functional from too much heat. | Network of tubules throughout cell. Rough ER is where proteins are synthesized. | Enzymes which have changed shape and are non-functional from too much heat. |
| An enzyme which brings multiple substrate molecules together as one new molecule. | The water solution inside the cell. | An enzyme which brings multiple substrate molecules together as one new molecule. |
| An enzyme which breaks a single molecule down into multiple smaller molecules. | The control centre of a cell, contains the DNA. | An enzyme which breaks a single molecule down into multiple smaller molecules. |
| **The process of converting light energy into stored chemical energy.** | **The process of converting glucose into usable energy.** | **The process of converting glucose into usable energy.** |
| The site of photosynthesis in a plant cell. | The site of respiration – the cell’s energy factories. | The site of respiration – the cell’s energy factories. |
| The green pigment which absorbs energy from light. | The inner membrane foldings of a mitochondrion ( for electron transport chain). | The inner membrane foldings of a mitochondrion ( for electron transport chain). |
| Membrane containing chlorophyll. | Fluid-filled space inside mitochondrion where Kreb’s cycle occurs. | Fluid-filled space inside mitochondrion where Kreb’s cycle occurs. |
| Stacks of thylakoid membranes | The energy currency of living things – Adenosine Tri-Phosphate. | The energy currency of living things – Adenosine Tri-Phosphate. |
| The carbon-fixing, light-independent phase of photosynthesis occurring in the stroma. | Occurring with or without oxygen. Respiration is less efficient anaerobically. | Occurring with or without oxygen. Respiration is less efficient anaerobically. |
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| The passive movement of molecules from areas of high to low concentration. | **The physical parts of a cell.** | **The physical parts of a cell.** |
| Diffusion of water (high🡪low conc.) across a semi-permeable membrane.  | The cellular structures inside a cell which perform different functions. | The cellular structures inside a cell which perform different functions. |
| Material being engulfed by a cell (phagocytosis or pinosytosis). | Sacs carrying enzymes to break down foreign materials. | Sacs carrying enzymes to break down foreign materials. |
| No energy required to move molecules in or out of cell. | A lipid bilayer surrounding the cell. | A lipid bilayer surrounding the cell. |
| Use energy (active transport) to move molecules against concentration gradient. | A pair of cells which can close to prevent water loss in leaves by evaporation. | A pair of cells which can close to prevent water loss in leaves by evaporation. |
| The release of vesicle contents to the outside of the cell. | A pore/Pores which allow gases to move in and out of a leaf. | A pore/Pores which allow gases to move in and out of a leaf. |
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| An enzyme which brings multiple substrate molecules together as one new molecule. | The water solution inside the cell. | The water solution inside the cell. |
| An enzyme which breaks a single molecule down into multiple smaller molecules. | The control centre of a cell, contains the DNA. | The control centre of a cell, contains the DNA. |