National 4 key areas: Cell Biology.

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| **Key area 1: Cell division and its role in growth and repair.** | **I know this.** | **I need to go over this.** | **I don’t know this.** |
| Cell division is essential to allow organisms to grow and repair damaged parts, eg cuts, broken bones. |  |  |  |
| During cell division, the parent cell divides to produce two identical cells, which contain the same number of chromosomes in their nuclei as the parent cell. |  |  |  |
| Cancer cells result from uncontrolled cell division |  |  |  |
| **Key area 2: DNA, genes and chromosomes.** | **I know this.** | **I need to go over this.** | **I don’t know this.** |
| Genes are located on chromosomes in the nucleus. |  |  |  |
| Genes are made of DNA which carries the instructions to make proteins. |  |  |  |
| Genes are passed on from parents to offspring. |  |  |  |
| Each individual’s DNA is unique. |  |  |  |
| **Key area 3: Therapeutic use of cells.** | **I know this.** | **I need to go over this.** | **I don’t know this.** |
| Insulin or other protein production via genetic engineering. |  |  |  |
| Other examples may include stem cell technology or using cells to grow artificial organs. |  |  |  |
| **Key area 4: Properties of enzymes and their use in industries.** | **I know this.** | **I need to go over this.** | **I don’t know this.** |
| Enzymes are found in living cells. |  |  |  |
| They are specific, speed up reactions in cells and remain unchanged by the reaction. |  |  |  |
| Enzymes build-up and break-down molecules. |  |  |  |
| The actual mechanism of how they do this is not required. |  |  |  |
| Enzymes can be used in a range of biotechnology industries. |  |  |  |
| **Key area 5: Properties of microorganisms and their use in industries.** | **I know this.** | **I need to go over this.** | **I don’t know this.** |
| Properties of microorganisms include rapid growth, diverse use of food source and wide range of products. |  |  |  |
| Examples of how some microorganisms work and are used in industrial processes, eg yeast in baking and brewing, bacteria for yoghurt, cheese and biofuel production. |  |  |  |
| **Key area 6: The effect of limiting factors on photosynthesis.** | **I know this.** | **I need to go over this.** | **I don’t know this.** |
| If any of the requirements (light, water, carbon dioxide or a suitable temperature) are low or missing, the photosynthesis rate is limited. |  |  |  |
| By overcoming these limitations, faster growth rates can be achieved. |  |  |  |
| **Key area 7: The process of respiration and the factors that can affect it.** | **I know this.** | **I need to go over this.** | **I don’t know this.** |
| Respiration is used to release energy for use in cells. |  |  |  |
| Oxygen may or may not be used in yeast, plant and animal cells. |  |  |  |
| When oxygen is available, yeast, plant and animal cells use glucose to produce carbon dioxide and water. |  |  |  |
| Without oxygen, yeast and plant cells use glucose to produce alcohol and carbon dioxide. |  |  |  |
| Without oxygen, animal cells use glucose to produce lactic acid. |  |  |  |
| More energy is released per molecule of glucose when oxygen is present. |  |  |  |
| The respiration process is enzyme controlled in all cases and so is affected by temperature. |  |  |  |
| **Key area 8: Controversial biological procedures.** | **I know this.** | **I need to go over this.** | **I don’t know this.** |
| Investigate/debate any relevant interesting topic, eg gene therapy, pharming, transgenic animals and plants. |  |  |  |