Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_\_\_

**Unit 8 Map - Gene Regulation and Biotechnology**

AP Biology

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| --- | --- | --- | --- |
| **Topic** | **Learning Target** |  **Checkpoint Score** (%) | **Test Score** (%) |
| 1. Gene Regulation and Organism Development | A. I can identify the purpose of gene regulation in prokaryotic and eukaryotic cells.  |  |  |
| B. I can explain how inducible and repressible operons are regulated in prokaryotic cells. |
| C. I can compare / contrast the different levels of gene regulation in eukaryotic cells. |
| D. I can describe the role of cytoplasmic determinants and homeotic genes in pattern formation. |
| E. I can describe the role of apoptosis in morphogenesis.  |
| F. I can describe the role of transcription factors, RNA interference, embryonic induction, environmental cues, etc. in cell differentiation. |
| 2. Biotechnology  | G. I can describe the purpose and methods of gel electrophoresis and analyze electrophoresis results. |  |  |
| H. I can describe the purpose and methods of polymerase chain reaction (PCR).  |
| I. I can describe the purpose and methods of bacterial transformation and analyze bacterial transformation results.  |
| J. I can provide examples of the practical uses of biotechnology, including insulin production and cloning.  |

**Unit 7 Key Vocabulary (not necessarily all words, but a good place to start)**

|  |  |
| --- | --- |
| **Topic 1: Gene Regulation & Development** | **Topic 2: Biotechnology** |
| HistonesHistone acetylationDNA methylationHeterochromatinEuchromatinPromoter RegionTATA BoxEnhancersActivatorRepressorsCorepressorTransponsonsOperatorOperonRegulatory geneRepressible operonInducible operonLac operonInducerActivatorCell differentiationDifferential gene expressionEpigenetic inheritance Feedback inhibitionProteasomesOncogenesMicro-RNA (miRNA)MorphogenesisApical meristemsBlastulaGastrulaTotipotent cellsStem cellsEmbryonic stem cellsPluripotent cellsHomeotic genesCell lineageHomeoboxHox genes | Recombinant DNAGenetic engineeringBiotechnologyGene cloningRestriction siteRestriction fragmentsSticky endsCloning vectorDNA denaturationPolymerase chain reaction (PCR)Gel electrophoresisSouthern blottingRestriction length polymorphisms (RFLP’s)Human Genome ProjectDNA microarray assaysGene therapyDNA fingerprintGenetically modified organisms (GMO’s)pGLOPlasmid Mapping |