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**Quarter 3: Curriculum Map for Biology**

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| TN Standards | Embedded Standards | Learning Outcomes | Adopted Resources | Supplemental Resources |
| **Unit 6-Molecular Genetics- 4 weeks** | | | |  |
| CLE 3210.4.1Investigate how genetic information is encoded in nucleic acids.  CLE 3210.4.2Describe the relationships among genes, chromosomes, proteins, and hereditary traits. | SPI 3210.Inq.6 Communicate and defend scientific findings.  SPI 3210 Inq.2 Design and conduct scientific investigations to explore new phenomena, verify previous results, test how well a theory predicts and compare opposing theories.  SPI 3210 Math.2 Analyze graphs to interpret biological events.  SPI 3210 T/E.2  Differentiate among elements of the engineering design cycle: design constraints, model building, testing, evaluating, modifying, and retesting. | SPI 3210.4.1  Identify the structure and function of DNA.  SPI 3210.4.2Associate the process of DNA replication with its biological significance.  SPI 3210.4.3Recognize the interactions between DNA and RNA during protein synthesis.  SPI 3210.4.5  Apply pedigree data to interpret various modes of genetic inheritance. | Text Prentice Hall  Ch 12 (pp.287-312).  SE Inquiry Activity  How do codes work?, p.286.  SE Analyzing Data  Synthesis of New DNA Molecules, p.296.  SE Quick Lab-How does a cell interpret DNA?, p. 303.  Chapter Lab  Modeling DNA Replication p. 313.  Lab Manual A  Ch 12 Extracting DNA  TE Demonstration pp. 291, 295, 302, 307.  TE Build Science Skills  pp. 293, 297, 303. | DNA and RNA Activities  <http://www.nclark.net/DNA_RNA>  DNA Model Project using a Paper Towel roll -YouTube by R.Hamiliton  <https://www.youtube.com/watch?v=IN3tBkk8UjQ>  Codon Bingo Revised-Biology Junction  <http://www.biologyjunction.com/biology_projects.htm>  Mutation Lab-Biology Junction  <http://www.biologyjunction.com/biology_projects.htm>  On Line Karyotype Lab-Biology Junction  <http://www.biologyjunction.com/biology_projects.htm>  Crossing Over Lab-Biology Junction  <http://www.biologyjunction.com/biology_projects.htm>  Bozeman Science podcasts (Biology)  <http://www.bozemanscience.com> |
| TN Standards | Embedded Standards | Learning Outcomes | Adopted Resources | Supplemental Resources |
| **Unit 7-Genetic Disorder & Genetic Engineering-2 weeks** | | | |  |
| CLE 3210.4.6Describe the connection between mutations and human genetic disorders.  CLE 3210.4.7Assess the scientific and ethical ramifications of emerging genetic technologies. | SPI 3210.Inq.5  Compare experimental evidence and conclusions with those drawn by others about the same testable question.  SPI 3210.Inq.1 Recognize that science is a progressive endeavor that reevaluates and extends what is already accepted. | SPI 3210.4.6Describe how meiosis is involved in the production of egg and sperm cells.  SPI 3210.4.8Determine the relationship between mutations and human genetic disorders.  SPI 3210.4.9Evaluate the scientific and ethical issues associated with gene technologies: genetic engineering, cloning, transgenic organism production, stem cell research, and DNA fingerprinting. | Text Prentice Hall  Chapter 13 (pp. 319-333).  SE Quick Lab  How can restriction enzymes be modeled?, p.326.  Text-Prentice Hall  Chapter 14 (pp. 342-360).  SE Inquiry Activity  Can you predict chin shape?, p340.  SE Problem Solving  Using a pedigree, p. 343.  Lab Manual A  Chapter 14 Lab-Karyotype  SE Quick Lab  How is colorblindness transmitted?, p. 351.  SE Chapter Lab  Modeling DNA Probes, p. 361.  TE Build Science Skills  (pp. 342, 344, 346,347, 348, 349, 350, 360).  SE Issues in Biology  Who Controls Your DNA?, p. 354. | Ethical Issues genetic engineering  <http://www.actionbioscience.org/biotechnology/glenn.html>  The Genetics of Blood Disorders-Biology Corner  <http://www.biologycorner.com/worksheets/genetics_of_blood_disorders.html>  Gene Mutations and Protein  <http://www.nclark.net/GeneMutation.pdf>  VCU Life Science Videos  <http://www.sosq.vcu.edu/videos.aspx>  Howard Hughes Medical Institute Free Resources for Science Education  <http://www.hhmi.org> |
| TN Standards | Embedded Standards | Learning Outcomes | Adopted Resources | Supplemental Resources |
| **Unit 8-Population Ecology & Energy Flow-3 weeks** | | | |  |
| CLE 3210.3.1Analyze energy flow through an ecosystem.  CLE 3210.3.4Describe the events which occur during the major biogeochemical cycles.  CLE 3210.2.1Investigate how the dynamic equilibrium of an ecological community is associated with interactions among its organisms.  CLE 3210.2.2Analyze and interpret population data, graphs, or diagrams.  CLE 3210.2.3Predict how global climate change, human activity, geologic events, and the introduction of non-native species impact an ecosystem.  CLE 3210.2.4Describe the sequence of events associated with biological succession. | SPI 3210.T/E.4  Describe the dynamic interplay among science, technology, and engineering within living earth-space and physical systems.  SPI 3210.Inq.3  Use appropriate tools and technology to collect precise and accurate data.  SPI 3210.Inq.2  Design and conduct scientific investigations to explore new phenomena, verify previous results, test how well a theory predicts and compare opposing theories.  SPI 3210.Inq.5  Compare experimental evidence and conclusions with those drawn by others about the same testable question.  SPI 3210.T/E1  Explore the impact of technology on social, political, and economic systems.  SPI 3210.T/E.4  Describe the dynamic interplay among science, technology and engineering within living, earth-space, and physical systems. | SPI 3210.3.1Interpret a diagram that illustrates energy flow in an ecosystem.  SPI 3210.3.4  Predict how changes in a biogeochemical cycle can affect an ecosystem.  SPI 3210.2.1  Predict how population changes of organisms at different trophic levels affect an ecosystem.  SPI 3210.2.2Interpret the relationship between environmental factors and fluctuations in population size.  SPI 3210.2.3Determine how the carrying capacity of an ecosystem is affected by interactions among organisms.    SPI 3210.2.4Predict how various types of human activities affect the environment.  SPI 3210.2.5  Make inferences about how a specific environmental change can affect the amount of biodiversity.  SPI 3210.2.6  Predict how a specific environmental change may lead to the extinction of a particular species.  SPI 3210.2.7Analyze factors responsible for the changes associated with biological  succession. | Text-Prentice Hall (Ch 3 pp. 63-80).  SE Quick Lab  How is a food chain organized, p. 70.  Analyzing Data  Farming in the Rye, p.79.  Lab Manual A  Chapter 3 Lab  Text-Prentice Hall (Ch 4 pp. 90-97).  SE Quick Lab  How do abiotic factors affect different plant species?,p. 91.  TE Build Science Skills (p. 90, 92, 93, 94, 96).  SE Chapter Lab  Observing Succession, p.113.  Lab Manual A  Chapter 4 Lab  Text-Prentice Hall Ch 5 (pp. 118-133)  SE Inquiry Activity  How do populations grow?,p118.  SE Analyzing Data  Population Trends, p.123.  SE Quick Lab  How does competition affect growth?, p. 125.  SE Chapter Lab  Investigation the Growth of a Population of Bacteria p. 133.  Lab Manual A  Chapter 5 Lab  Text- Ch 6 (pp. 144-160).  SE Quick Lab  How does biological magnification occur?,p.153  SE Analyzing Data  Banning CFCs, p.158.  SE Chapter Lab  Observing the Effects of Acid Rain, p.161.  Lab Manual A  Chapter 6 Lab | Food Web Lab- Biology Junction  <http://www.biologyjunction.com/biology_projects.htm>  Random Sampling Lab- Biology Junction  <http://www.biologyjunction.com/biology_projects.htm>  How many raccoons can live in this woods? Biology Junction  <http://www.biologyjunction.com/biology_projects.htm>  Where the hippos roam – Biology Junction  <http://www.biologyjunction.com/biology_projects.htm>  Predator/Prey graph-The Biology Corner  <http://www.biologycorner.com/lesson-plans/ecology/>  The Lesson of the Kaibab –The Biology Corner  <http://www.biologycorner.com/lesson-plans/ecology/>  Spread of an Infectious Disease and Population Growth  <http://www.lessonplansinc.com/science.php?/biology/lessonplans/C112/>  Human Population Growth  <http://www.lessonplansinc.com/science.php?/biology/lessonplans/C112/>  Succession  <http://www.nacs.k12.in.us/cms/lib07/IN01906695/Centricity/Domain/327/27%20Succession-S.pdf> |