APPENDIX IV

TAB S

EXHIBIT B

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED COURSE/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life.

GRADE(S): 9 **COURSE LENGTH:** 90 days **DURATION:** 90 min. pds. **FREQUENCY:** 6 out of 6

WRITTEN BY:

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
8 Days	**Chapter One- The Science of Biology**			
3 days	Students will be able to list and define the characteristics of life.	3.3.10.A	Lecture Labs Teacher demonstration Student discussion	Biology: The Living Science Textbook Living/Nonliving collage
2 days	Students will be able to list, define, and give examples of the levels of organization in biology from atoms to biosphere.	3.3.10.A	Student activity Student discussion	Levels of Organization WS Pyramid activity
3 days	Students will be able to use a microscope properly. Students will differentiate between the scanning electron, transmission electron, compound light, and stereomicroscopes.	3.7.10.A 3.7.10.B	Lab Lecture Demonstration Homework	Textbook Microscope Lab Microscope handout Microscope drawing guide

DOVER AREA SCHOOL DISTRICT

BIOLOGY CHAPTER 1 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Mathematical conversions Artistic expression Problem solving techniques	Research history of microscopes Expand on science project Research biologists that study the different levels of organization Lab report	Model steps as you teach One-on-one instruction Provide visual help Allow more time to work	Unit One Exam Laboratory activities Quizzes Homework

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED COURSE/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life

GRADE(S): 9 **COURSE LENGTH: 90 days** **DURATION: 90 minutes** **FREQUENCY: 6 out of 6**

WRITTEN BY:

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
11 days	**Chapter 2 – The Chemistry of Life**			
1 day	Students will be able to differentiate between organic and inorganic molecules. Students will be able to experiment with and define the properties of water.	3.3.10.B	Lab Lecture Homework	Textbook Periodic tables Water lab
1 day	Students will be able to identify acids and bases by their pH values.	3.3.10.B	Lecture Lab	Acid/Base Lab
1 day	Students will be able to define the characteristics of carbohydrates and their building blocks.	3.3.10.B 9.3.9.E	Lecture Student activity	Pasta Power packet Carbohydrate activity
3 days	Students will be able to build	3.3.10.B	Lab	Pasta Power packet

	structural models for all types of carbohydrates.		Student activity	Molecular Model Lab
1 day	Students will be able to perform qualitative tests on foods.	3.3.10.B 9.3.9.E	Lab	Carbohydrate lab Pasta Power packet
1 day	Students will be able to identify the characteristics of lipids and the functions of lipids in the body.	3.3.10.B 9.3.9.D	Lecture Student activity and practice	Cholesterol video Lipid activity
1 day	Students will be able to calculate percentage of body fat using the skin calipers. Students will be able to qualitatively test for lipids.	3.3.10.B 9.3.9.D	Student activity Lab	Percent body fat calculation Lipid lab
2 days	Students will be able to identify the characteristics of proteins and their functions within the human body.	3.3.10.B	Lecture Student activity	Protein activity
1 day	Students will be able to qualitatively test food products for the presence of specific organic compounds.	3.3.10.B	Lab	Biochemistry Lab Lab write up

DOVER AREA SCHOOL DISTRICT

BIOLOGY I – CHAPTER 2 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Family and Consumer Sciences Nutritional and dietary planning Writing	Plan a weekly diet incorporating each organic compound. Build models of each of the compounds.	Outline to support comprehension Help students with vocabulary terms Break down information into shorter tests	Chapter 2 Exam Lab activities Lab write-up Pasta Power writing activity Homework assignments

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED COURSE/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life

GRADE(S): 9 **COURSE LENGTH: 90 days** **DURATION: 90 minutes** **FREQUENCY: 6 out of 6**

WRITTEN BY:

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
8 days	**Chapter 3 – Cell structure and function**			
1 day	The student will be able to differentiate between a eukaryotic and a prokaryotic cell. The student will be able to explain how the cell shape relates to its function. The student will be able to differentiate between a plant and an animal cell.	3.3.10.A 3.3.10.B	Lecture Demonstration	Textbook Computer Cell pictures
3 days	The student will be able to diagram a typical animal or plant cell and explain the functions of the organelles.	3.3.10.A 3.3.10.B	Student project	Textbook Internet Power point presentation Cell project outline Computer lab
2 days	The students will be able to identify the parts of a cell under the microscope.	3.3.10.A 3.3.10.B	Lab	Cell lab Microscopes

1 day	The students will be able to differentiate between passive and active transport, diffusion and osmosis, and hypertonic, hypotonic, and isotonic.	3.3.10.A 3.3.10.B	Lecture Demonstration Student activity	Hypertonic, hypotonic, and isotonic worksheet
1 day	The student will be able to determine the rate of osmosis using dialysis tubing.	3.3.10.A 3.3.10.B	Lab	Rate of osmosis lab

DOVER AREA SCHOOL DISTRICT

BIOLOGY I – CHAPTER 3 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Physics – lenses Medicine	Describe how osmosis affects living things (i.e. penicillin).	Read tests Group study sessions Help student with vocabulary terms	Chapter 3 Exam Cell Project Lab activities

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED COURSE/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life

GRADE(S): 9 **COURSE LENGTH: 90 days** **DURATION: 90 minutes** **FREQUENCY: 6 out of 6**

WRITTEN BY:

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
8 days	**Chapter 4 – Energy and the Cell**			
1 day	The students will be able to explain how energy is stored in ATP. To list how energy is converted from one form to another.	3.3.10.B	Lecture Demonstration	Textbook Lime water demonstration
2 days	The student will be able to describe the structure of ATP and how it is used by the body for the energy.	3.3.10.B	Student activity	ATP advertisement activity
1 day	The student will be able to	3.3.10.B	Lab	Fermentation Lab

	demonstrate fermentation and to determine the reactants and products.			
2 days	The student will be able to describe the overall reaction of cellular respiration.	3.3.10.B	Student activity	Diagram cellular respiration
1 day	The student will be able to describe the light and dark reactions of photosynthesis. The student will be able to describe the function of chlorophyll.	3.3.10.B	Lecture Demonstration	Textbook
1 day	The student will be able to identify the pigments found in leaves and the function of those pigments.	3.3.10.B	Lab	Separation of Leaf Pigments Lab

DOVER AREA SCHOOL DISTRICT

BIOLOGY I – CHAPTER 4 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Physics Industrial uses of fermentation Mathematical equations Chemistry Aerobic and anaerobic exercises	Report on industrial uses of fermentation Muscles and ATP Define aerobic and anaerobic exercises Explain the function of other pigments in plants ex. Flower petals	Highlight important reactions Break down reactions into small steps Small group study sessions	Chapter 4 Exam ATP advertisements Lab activities Cellular respiration posters

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED COURSE/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life

GRADE(S): 9 **COURSE LENGTH: 90 days** **DURATION: 90 minutes** **FREQUENCY: 6 out of 6**

WRITTEN BY:

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
7 days	**Chapter 5 – Cell Division** **Chapter 6 – Genetics**			
1 day	Students will be able to differentiate between asexual and sexual reproduction. Students will be able to list reasons a cell would undergo mitosis.	3.3.10.C.1 3.3.10.C.3	Lecture Filmstrip Demonstration	Dukane filmstrip Overhead projector Colored pencils Mitosis/Meiosis packet
2 days	Students will be able to identify stages of mitosis under the microscope.	3.3.10.C.1	Lab	Microscope Onion root tip slides Fish blastula slides Colored pencils TV projection microscope
1 day	Students will be able to	3.3.10.C.1	Lab	Bead kit

	demonstrate their knowledge of the stages of mitosis and cytokinesis using beads and colored pencils.		Student activity	Colored pencils Chalk
1 day	Students will be able to describe what occurs in each stage of mitosis. Students will be able to list reasons for undergoing meiosis and compare it to mitosis. Students will be able to define tetrad, homologous chromosomes, diploid, haploid, gametes, zygote.	3.3.10.C.1	Quiz Lecture	Mitosis Quiz Mitosis/Meiosis packet Meiosis Overhead Overhead projector
1 day	Students will be able to draw the stages of meiosis to demonstrate what occurs in each stage.	3.3.10.C.3	Student activity	Mitosis/Meiosis packet Colored pencils
1 day	Students will be able to diagnose a chromosomal abnormality using a karyotype.	3.3.12.C.4	Student activity/lab	Karyotype lab

DOVER AREA SCHOOL DISTRICT

BIOLOGYI -CHAPTERS 5 & 6 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Math Art Health	Research and report on how mitosis is related to cancer. Interview a genetic counselor to learn the problems that can occur with meiosis and aging. Differentiate between males and females undergoing meiosis.	Outline to support comprehension Help students with vocabulary terms Break down information into shorter tests	Mitosis Quiz Meiosis Quiz Lab reports Mitosis/Meiosis Exam Cancer research paper

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED COURSE/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life

GRADE(S): 9 **COURSE LENGTH: 90 days** **DURATION: 90 minutes** **FREQUENCY: 6 out of 6**

WRITTEN BY:

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
12 days	**Chapter 6 – Genetics** **Chapter 7 – Human Inheritance**			
1 day	Students will be able to describe Mendel's study on pea plants. Students will be able to define homozygous, heterozygous, dominant, and recessive, phenotype, and genotype, and generation names.	3.3.10.C.4	Lecture Student activity	Mendel worksheet
1 day	Students will be able to investigate some human traits that are inherited by simple dominant and recessive alleles.	3.3.10.C.6	Lab	Human Genetics Lab Investigating Human Traits Lab Coins
1 day	Students will be able to	3.3.10.C.2	Research	Library

	research a genetic disease.			Internet Research activity
1 day	Students will be able to cross two monohybrid traits and describe the resulting offspring.	3.3.10.C.6	Lecture Student practice	Monohybrid problems
1 day	Students will be able to cross variations of two traits and predict the results.	3.3.10.C.6	Lecture Student practice Lab	Dihybrid problems Corn dihybrid lab Investigation of Dihybrid Crossing
1 day	Students will be able to cross variations of a codominant trait and predict the results.	3.3.10.C.6	Lecture Student practice	Codominant problems
1 day	Students will be able to cross variations of a sex-linked trait and predict the results.	3.3.10.C.6	Lecture Student practice	Sex-linked problems
1 day	Students will be able to cross variations of a multiple allele problem and predict the results. Students will be able to determine the paternity of a baby using knowledge of bloodtyping genetics.	3.3.10.C.6	Lecture Student practice Lab	Bloodtyping problems Paternity Test Lab
1 day	Students will be able to describe the results of multiple gene and pedigree problems.	3.3.10.C.6	Lecture Student practice	Pedigree problems Multiple gene problems
1 day	Students will be able to	3.3.10.D.4	Video and discussion	Secret of Life video

	discuss the controversy of nature vs. nuture.			collection TV/VCR Video questionnaire
1 day	Students will be able to discuss the ramifications of using DNA to design their own children and cloning.	3.3.10.D.4	Video and discussion	Secret of Life video collection TV/VCR Video questionnaire
1 day	Students will be able to describe several genetic disorders.	3.3.10.C.2	Student oral reports	Genetic disorder reports grade sheets

DOVER AREA SCHOOL DISTRICT

BIOLOGY I – CHAPTERS 6 & 7PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Health Family and Consumer Sciences Mathematics	Fruit fly cross Pedigree analysis of family	Allow more time for tests Break down problems into steps Individual instruction Study guides After school tutoring	Monohybrid Quiz Dihybrid Quiz Codominant Quiz Sex-linked Quiz Bloodtyping Quiz Multiple Gene Quiz Genetics Exam Lab write-ups

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED COURSE/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life

GRADE(S): 9 **COURSE LENGTH: 90 days** **DURATION: 90 minutes** **FREQUENCY: 6 out of 6**

WRITTEN BY:

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
9 days	**Chapter 8 – DNA and RNA** **Chapter 9 – Genetic Engineering**			
1 day	Students will be able to describe the structure of DNA, where its found, and its function.	3.3.10.C.5	Lecture Student activity	DNA packet DNA kits
1 day	Students will be able to construct a DNA model, drawing and labeling all parts.	3.3.10.C.5	Student activity	DNA kits Colored pencils
1 day	Students will be able to discuss the applications of using DNA in criminal trials.	3.3.10.C.5	Video and discussion	Murder, Rape, and DNA video Video questionnaire
1 day	Students will be able to	3.3.10.C.7	Lecture	DNA packet

	describe the steps of transcription and diagram those steps.		Student activity	DNA kits Colored pencils
1 day	Students will be able to describe the steps of translation and diagram those steps.	3.3.10.C.7	Lecture Student activity	DNA packet DNA kits Colored pencils
1 day	Students will be able to synthesize the information on protein synthesis using models and a strand of DNA to code for traits on a make believe animal.	3.3.10.C.7	Lab Student activity	DNA packet DNA kits Protein synthesis lab
1 day	Students will be able to define and describe types of chromosomal and gene mutations.	3.3.10.C.2	Lecture Students activity	Textbook Colored pencils
1 day	Students will be able to describe how scientists manipulate DNA to insert certain genes.	3.3.12.C.3	Lecture Lab	Genetic Manipulation Lab
1 day	Students will be able to discuss the real world implications of genetic recombination.	3.3.12.C.3	Video and discussion Readings	The Mouse that Laid the Golden Egg video "Your World" magazines

DOVER AREA SCHOOL DISTRICT

BIOLOGY I – CHAPTERS 8 & 9 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Art Health	Human Genome Project report DNA fingerprinting and electrophoresis	Study guides Tests read to students More time to take test DNA manipulatives	DNA Exam DNA Performance Exam Lab write-ups

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED INSTRUCTION/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life

GRADE(S): 9 **COURSE LENGTH:** 90 days **DURATION:** 90 minutes **FREQUENCY:** daily

WRITTEN BY:

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
19 days	**Chapter 10 – Natural Selection** **Chapter 11 – The Mechanism of Evolution** **Chapter 12 – The Origins of Biodiversity**			
1 day	Students will be able to discuss Darwin's observations of the living world. Students will be able to discuss the variability found in nature.	3.3.10.D	Lecture Mini Lab	Textbook Graph paper
2 days	Students will be able to describe biomes and list the adaptations that organisms have to survive in this environment.	3.3.10.D.6	Research Student reports	Textbook Library Internet Art supplies
1 day	Students will be able to determine how limiting factors work to limit population sizes.	3.3.10.D.6	Lecture Student activity	Green peppers Worksheets Textbook
1 day	Students will be able to define types of competition and how they relate to population size.	3.3.10.D.6	Lecture Video	TV/VCR Video questionnaire
1 day	Students will be able to list evidences used to support Darwin's theory of the Origins of Species.	3.3.10.D.1	Lecture Lab	Evolution Worksheet Biochemical Evidence Lab
	Students will be made aware of gaps/problems in Darwin's Theory and of other theories of evolution including, but not limited to Intelligent Design.	3.3.10.D.1	Lecture	Reference: Of Pandas and People

Note: The Origins of Life is not taught.

Board Approved 10/18/04

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
3 days	Students will be able to make a time line that demonstrates evolutionary changes during the history of earth.	3.3.10.D.5	Lab	Textbook Simulating Natural Selection Lab
1 day	Students will be able to define natural selection and artificial selection and demonstrate the process.	3.3.10.D.6	Lab Lecture	Textbook Simulating Natural Selection Lab
1 day	Students will be able to design a species placed under climatic pressure.	3.3.10.D.6	Lecture Student Activity	Darwin meets DNA activity Textbook
1 day	Students will be able to differentiate between disruptive, directional and stabilizing selection.	3.3.10.D.6	Lecture Student Activity	Darwin meets DNA activity Textbook
1 day	Students will be able to graph the types of selection using human height	3.3.10.D.6	Student Activity	Textbook Graph paper Colored pencils
1 day	Students will be able to describe how speciation takes place using Darwin's finches as an example.	3.3.10.D.6	Lecture Lab	Pliers lab
1 day	Students will be able to list how species change due to reproductive isolation.	3.3.10.D.6	Video and Discussion	Voyage to the Galapagos Video Video questionnaire
1 day	Students will be able to differentiate between adaptive radiation and convergent evolution.	3.3.10.D.6	Lecture Student Activity	Textbook Backyard evolution activity
3 days	Students will be able to discuss the importance of biodiversity and list reasons why organisms have become extinct.	3.3.10.D.3	Lecture Student Research and Activity	Endangered species trading cards

DOVER AREA SCHOOL DISTRICT

BIOLOGY I – CHAPTERS 10, 11, 12 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Earth Science Math Writing	Research dinosaur extinction Create a phylogenetic tree on any species Fossil studies of Pennsylvania	Study guides Extra time on tests One-on-one instruction	Evolution Exam Lab write-ups Projects