	Pine Hill Public Schools Curriculum					
Content A	rea:	Science				
Course Tit	le/ Grade Level:	AP Biology / 11 & 1	12			
Unit 1:	The Principles of Ce	llular Life	Duration:	4 weeks		
Unit 2:	The Cell Cycle, Stru	cture and Function	Duration:	4 weeks		
Unit 3:	Principle of Inherita	nce	Duration:	4 weeks		
Unit 4:	Taxonomy: Classification of Plants and Animals		Duration:	4 weeks		
Unit 5:	Reproduction in plan	nts and Animals	Duration:	4 weeks		
Unit 6:	How Animals Work		Duration:	4 weeks		
Unit 7:	Principle of Ecology	,	Duration:	4 weeks		
Unit 8: Interactions of Biotic and Abiotic fon Earth		e and Abiotic factors	Duration:	4 weeks		
Date Creat	ted or Revised: 2	011				
BOE Approval Date: 8		/28/12				

Pine Hill Public Schools						
Science Curriculum						
Unit Title:	The Principles of Cellular Life	Unit # 1				
Course or Gr	rade Level: AP Biology	Length of Time: 4 weeks				
Pacing						
Essential Questions	 How are cells considered to be the structural and functional unit of Life? What cellular processes are based on physical and chemical changes? How does energy change form? How do enzymes work? What are the differences between prokaryotic and eukaryotic cells? What is the structure of the plasma membrane? What are the cellular organelles and their functions 					
Content	-The chemistry of life The unique chemical and physical properties of water The role of carbon in the diversity of life The structure of carbohydrates, lipids, protein and nucleic acids The energy changes in the biochemical processes of organisms The regulation of enzymes in chemical reactions The structure of enzymes The enzyme substrate model The structure of prokaryotic and eukaryotic cells The model of the plasma membrane The diverse transport mechanisms of the plasma membrane Callular organalles and their functions					
Skills	Cellular organelles and their functions •					
Math Skills/ Science Processes	-Use of graphs- Creation and usage of data tables- Use of Graphing Calculators-graph of graphs and charts					

Asses	ssments	-Homework	-Homework/class work					
		-Quiz	-Quiz					
		-Test	-Test					
		-Laboratorie	-Laboratories					
diffe	ventions / rentiated uction	-Include hands -Provide mater	-Provide advanced notice of tests -Include hands-on activities -Provide material at student's level of functioning					
-	plinary nections	-Connection t -Science and -Scientific di	- Mathematical connections -Connection to English -Science and society -Scientific discoveries and the link to Ethics					
Lesso resou Activ	irces /	- Hands-on activities -Laboratories related to the subject matter -Word processing systems -Computer access						
			2009 N.	JCCCS				
Stan	dard:							
Strai	nd(s):							
Cont	ent Stateme	ent(s):		CPI#	/ CPI (s):			
			21st Centur	ry Ther	<u>nes</u>			
Global Awareness Financial, Economic, Business, and Entrepreneuria Literacy			Civic Literacy		Health Literacy			
	21st Century Skills							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy	
	Media Lit	Media Literacy ICT Literacy			Life and Career Skills			

Pine Hill Public Schools Science Curriculum					
Unit Title: T	he Cell Cycle, Structure and Function	Unit # 2			
Course or Gra	de Level: AP Biology	Length of Time: 4 weeks			
Pacing					
Essential Questions	What is the cell cycle and how is it regulated? What is the importance of mitosis regarding the distribution of genetic info to new cells? What factors limit cell size? What is the mechanism of cytokinesis? How can errors in the cell cycle lead to tumor formation? The role of ATP in anabolic and catabolic processes? How does photosynthesis work? How does cellular respiration work to release energy?				
Content	The cell cycle and its regulation The purpose of mitosis relative to the cell cycle Mitosis and genetic continuity Mitosis and cancer The role of ATP in coupling anabolic and catabolic processes? The role of chemiosmosis in bioenergetics The breakdown of organic molecules by catabolic pathways The role of oxygen in energy-yielding pathways The generation of ATP in the absence of oxygen in cells The conversion of light energy during photosynthesis The manufacturing of carbohydrates by autotrophs				
Skills	Describe the stages of the cell cycle and how they are regulated Discuss the purpose of mitosis and relate to asexual reproduction Relate mitosis to genetic continuity in the offspring Describe the events that lead to cancer; uncontrolled mitosis Identify the role of ATP in all metabolic activities Describe the breakdown of organic molecules to yield ATP Relate the importance of oxygen to energy release Describe the photosynthetic reaction Compare and contrast photosynthesis to respiration Distinguish between an				
Math Skills/ Science Processes	 -Use of graphs - Creation and usage of data tables - Use of Graphing Calculators - graph of graphs and charts 				
Assessments	-Homework/class work -Quiz -Test -Laboratories				

	ventions /	-Provide advanced notice of tests -Include hands-on activities						
	rentiated	-Provide material at student's level of functioning						
instr	uction	-Use multi sen		ing				
-	- plinary nections	- Mathematica -Connection t -Science and -Scientific di	- Mathematical connections -Connection to English -Science and society -Scientific discoveries and the link to Ethics					
Lesso	on	- Hands-on act						
	irces /	-Laboratories i -Word process	related to the subject matter					
Activ	vities	-Word process -Computer acc						
			•55					
			2009 NJ	ICCCS				
Stan	dard:							
Strai	nd(s):							
Cont	ent Stateme	ent(s):		CPI#	/ CPI (s):			
			21st Centur	y Ther	<u>nes</u>			
	Global Awa	areness	Financial, Economic,		Civic Literacy		Health Literacy	
			Business, and Entrepreneurial Literacy					
			21st Centu	ıry Skil	<u>lls</u>			
	Creativity	y and	Critical Thinking and Problem		Communication and		Information Literacy	
	Innovat		Solving		Collaboration			
	Media Literacy ICT Literacy				Life and	Caree	r Skills	

Pine Hill Public Schools Science Curriculum					
Unit Title:	Principle of Inheritance	Unit # 3			
Course or Gr	rade Level: AP biology	Length of Time: 4 weeks			
Pacing					
Essential Questions					
	What types of evidence support evolu	itionary theory?			
Content	What types of evidence support evolutionary theory? Meiosis and gametogenesis Features of meiosis in sexual reproduction Meiosis and its relationship to heredity Similarities and differences between gametogenesis in animals and gametogenesis in plants Organization of genetic info in eukaryotes Continuity and variability of genetic info Mendel's contribution to modern genetics Principal patterns of inheritance Structure of RNA and DNA and their relationship to their function Similarities and differences between prokaryotic and eukaryotic cells Mechanisms of gene expression in prokaryotes and eukaryotes Alteration of genetic info Recombinant nucleic acid technology Practical applications of biotechnology The origin of life Evidence for evolution Process of natural selection Role of natural selection in heredity Mechanisms for speciation				
Skills	 Macroevolution vs. microevolution Describe the process of meiosis Compare and contrast meiosis to mitosis Relate meiosis to gametogenesis Relate sexual reproduction to heredity Compare and contrast gametogenesis in pla Sample Mendelian patterns of inheritance Complete problems describing the principal 				

	• Differentia	 Compare and contrast the structure and function of DNA to RNA Differentiate between prokaryotic and eukaryotic hereditary material Identify ways that genetic information can be altered 			
	• Discuss the	• Discuss the modern recombinant nucleic acid techniques			
		technology to modern issues			
		he probable origin of life escribe the evidence for			
	•	escribe the evidence for			
Math Skills/	-Use of grap	bhs			
Science		nd usage of data tables			
Processes		phing Calculators			
		aphs and charts rk/class work			
Assessments		TR/Class WOTK			
	-Quiz -Test				
	- Test -Laborator	min a			
Ŧ		vanced notice of tests			
Interventions / differentiated		nds-on activities			
instruction		terial at student's level of function	ing		
mstruction		sensory approach			
Inter-		ical connections			
disciplinary	-Science ar	n to English			
Connections		discoveries and the link to Ethics			
Lesson	- Hands-on				
resources /		es related to the subject matter essing systems			
Activities	-Computer a				
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		2009 NJ	ICCCS		
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Content Statem	ent(s):		CPI#	/ CPI (s):	
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	Business, and Entrepreneuria				
		Literacy 21st Centu	ımı Çlel	No.	
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Creativit		Critical Thinking and Problem	1	Communication and Collaboration	Information Literacy
Innova Media Li		Solving ICT Literacy			Career Skills
Wicaid El	Media Eneracy Elic and Career Skills				Salver Skills

Pine Hill Public Schools Science Curriculum					
Unit Title: Ta	xonomy: Classification of Plants and Anin	nals	Unit # 4		
Course or Grad	le Level: AP Biology	Length of Time: 4 weeks			
Pacing					
Essential Questions	How are organisms classified? What are the 3 domains? What are the 6 kingdoms? Who are the representative members of these 6 kingdoms? What is the relationship that all organisms have to each other? What is the great diversity amongst all organisms? What are the major body plans of plants and animals?				
Content	What are the distinguishing characteristics of each phyla? Description of the 3 domains Description of the 6 kingdoms Major body design of the members in the 6 kingdoms Representative organisms from Monera, Fungi, Protista, Plant and Animal kingdom Characteristics of members of the 6 kingdoms Evidence that organisms are related to each other? Study of evolutionary relationships Classification system				
Skills	Name and describe the members of the 3 domains Name and describe the members of the 6 kingdoms Describe the body design of members belonging in each of the 6 kingdoms Characterize the members of the phyla belonging to these kingdoms Locate and identify the evidence that supports relationships between these members Describe phylogeny and its usefulness in evolution				
Math Skills/ Science Processes Assessments	List the divisions in our current classification system -Use of graphs - Creation and usage of data tables - Use of Graphing Calculators -graph of graphs and charts -Homework/class work -Quiz -Test				
Interventions / differentiated instruction Interdisciplinary Connections	-Laboratories				

resou	Lesson resources / Activities - Hands-on activities - Laboratories related to the subject matter - Word processing systems - Computer access						
			2009 NJ	CCCS			
Stan	Standard:						
Strai	Strand(s):						
Cont	tent Statement(s)):		CPI #/ CPI(s):			
			21st Century	y Ther	<u>nes</u>		
	Global Awarenes	SS	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
			21 st Centu	ry Ski	lls		
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and	Caree	r Skills

	Pine Hill Public Schools Science Curriculum					
Unit Title: Rep	production in plants and Animals	Unit # 5				
Course or Grad	e Level: AP Biology	Length of Time: 4 weeks				
Pacing						
Essential Questions	What are the patterns of reproduction and development in plants and animals and how are they regulated? What is the adaptive significance of alternation of generations? How are cells, tissues and organs organized How is structure and function related in the various organ systems? What adaptive features contributed to the success of various plants and animals on land?					
Content	Body plans of plants and animals Patterns of reproduction and development in plants and animal Differences between asexual and sexual reproduction Regulation of reproduction and development in plants and animals Organization of cells, tissues, organs into systems Interaction of various systems Adaptive features for terrestrial organisms Interaction of organisms with their environment					
Skills	Compare and contrast the various body plans amongst plants and animals Identify the basic patterns of reproduction and development in both plants and animals Distinguish between asexual and sexual reproduction and their purposes Describe how reproduction is regulated within the organism Discuss the levels of organization in both plants and animals Describe how various tissues, organs and body systems interact to maintain homeostasis					
Math Skills/	-Use of graphs					
Science Processes	Creation and usage of data tablesUse of Graphing Calculatorsgraph of graphs and charts					
Assessments	-graph of graphs and charts -Homework/class work -Quiz -Test -Laboratories					
Interventions / differentiated instruction	-Provide advanced notice of tests -Include hands-on activities -Provide material at student's level of functioning -Use multi sensory approach					
Inter- disciplinary Connections	- Mathematical connections -Connection to English -Science and society -Scientific discoveries and the link to Ethics					

Lesso resou Activ	urces /	ces / Laboratories related to the subject matter					
	2009 NJCCCS						
Stan	dard:						
Strai	Strand(s):						
Cont	tent Stateme	ent(s):		CPI#	/ CPI (s):		
			21st Centur	y Then	<u>nes</u>		
	Global Awa	areness	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
	21st Century Skills						
	Creativity Innovat		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Lit	eracy	ICT Literacy		Life and	Caree	Skills

	Pine Hill Public Schools						
	Science Curriculum						
Unit Title: H	Iow Animals Work	Unit # 6					
Course or Gra	nde Level: AP Biology	Length of Time: 8 weeks					
Pacing	1						
Essential Questions	**						
Content	- Animal tissues and organ system -Neural tissues -Sensory reception -Endocrine control -Structural support and movement -Circulation -Immunity -Respiration -Digestion and human nutrition -The internal environment -Human reproduction and development						
Skills	-Identify all body systems and list the function of each -Describe the role of sensory reception in animal survival -List the major functions of the Nervous system -Compare and contrast the major components of blood -Summarize the role of respiration -List the three main functions of the digestive system -Explain the role of the Endocrine system in maintaining homeostasis -Summarize the structures of the reproductive system -Describe the stages of human growth from infancy to adulthood						
Math Skills/ Science Processes	-Use of graphs - Creation and usage of data tables - Use of Graphing Calculators -graph of graphs and charts						
Assessments	-Homework/class work -Quiz -Test -Laboratories						

Inter	ventions /	-Provide advanced notice of tests							
diffe	rentiated	-Include hands-on activities							
instr	uction	-Provide material at student's level of functioning -Use multi sensory approach							
<u> </u>									
Inter		- Mathematical connections							
	plinary	-Connection to English							
Conr	nections	-Science and society -Scientific discoveries and the link to Ethics							
		-Scientific discoveries and the fillik to Ethics							
Lesso	n	- Hands-on act	tivities						
	irces /	-Laboratories	related to the subject matter						
Activ		-Word process	sing systems						
Acuv	ities	-Computer acc	cess						
2009 NJCCCS									
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Strai	Strand(s):								
Content Statement(s): CPI # / CPI(s):									
21st Century Themes									
	Global Awa	areness	Financial, Economic,		Civic Literacy		Health Literacy		
			Business, and Entrepreneurial						
	Literacy								
	21st Century Skills								
	Creativity		Critical Thinking and Problem		Communication and		Information Literacy		
	Innovat		Solving		Collaboration				
	Media Literacy ICT Literacy Life and Career Skills				r Skills				

Pine Hill Public Schools Science Curriculum						
Unit Title: Pr	inciple of Ecology	Unit # 7				
Course or Grad	le Level: AP Biology	Length of Time: 4 weeks				
Pacing						
Essential Questions	 What are Demographics? What is the difference between Expo How does competition relate to patter What are the major effects of Humar Which factors shape a community str What are the three types of Mutualist How does co-evolution influence Pre What are the major step in ecologica What is an ecosystem? How do food-webs effect the stability What are the major Bio-chemical cyc What is the Biosphere and its compon 	ens of survival and reproduction? a population growth? ucture? ic relationships? edator-Prey relationships? I succession? of an ecosystem? les?				
Content	-What are the major animal behaviors Body plans of plants and animals Patterns of reproduction and development in p Differences between asexual and sexual repro Regulation of reproduction and development organization of cells, tissues, organs into syst Interaction of various systems Adaptive features for terrestrial organisms	and how do they aid animal survival? plants and animal duction in plants and animals ems				
Skills	 Interaction of organisms with their environ Compare and contrast the various body plans Identify the basic patterns of reproduction and Distinguish between asexual and sexual reproduction is regulated within Discuss the levels of organization in both plan Describe how various tissues, organs and bod Relate the adaptive features of terrestrial orga Describe the various ways in which organism 	amongst plants and animals I development in both plants and animals duction and their purposes In the organism Its and animals by systems interact to maintain homeostasis on their success on land				
Math Skills/ Science Processes						
Assessments	-Homework/class work -Quiz -Test -Laboratories					

Inter	ventions /	-Provide advanced notice of tests							
diffe	rentiated	-Include hands-on activities							
instr	uction	-Provide material at student's level of functioning -Use multi sensory approach							
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Inter		- Mathematical connections							
	plinary	-Connection to English -Science and society							
Conr	nections		scoveries and the link to Ethics						
		Belefitifie di	Scientific discoveries and the fillik to Ethics						
Locci	Lesson - Hands-on activities								
	irces /	-Laboratories	related to the subject matter						
Activ		-Word process							
Acuv	rues	-Computer acc	eess						
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Strai	Strand(s):								
Content Statement(s): CPI # / CPI(s):									
21st Century Themes									
	Global Awa	areness	Financial, Economic,		Civic Literacy		Health Literacy		
			Business, and Entrepreneurial						
Literacy									
21st Century Skills									
	Creativity		Critical Thinking and Problem		Communication and		Information Literacy		
	Innovat		Solving		Collaboration				
	Media Lit	Media Literacy ICT Literacy Life and Career Skills				r Skills			

Pine Hill Public Schools Science Curriculum					
Unit Title: Inte	eractions of Biotic and Abiotic factors on E	Earth	Unit # 8		
Course or Grad	e Level: AP Biology	Length of Time: 4 weeks			
Essential Questions What are the responses of plants and animals to environmental cues, and how do hormones mediate the What models are useful in describing the growth of a population? How is population size regulated by abiotic and biotic factors? How is energy flow through an ecosystem related to trophic levels? How do certain elements cycle through ecosystems? How do organisms affect the cycling of elements and water through the Content What are the responses of plants and animals to environmental cues, and how do hormones mediate the What models are useful in describing the growth of a population?					
How is population size regulated by abiotic and biotic factors? How is energy flow through an ecosystem related to trophic levels? How do certain elements cycle through ecosystems? How do organisms affect the cycling of elements and water through the biosphere? How do biotic and abiotic factors affect community structure and ecosystem function? In which ways are humans affecting biogeochemical cycles?					
Skills	The structure and function of hormones Plant and animal responses to the environment Population model to predict growth Affect of biotic and abiotic factors on a population property flow through the trophic levels Cycling of carbon, nitrogen, phosphorus, sulforganisms affect on the cycling of these elem The affect of biotic and abiotic factors on cor Global issues e.g. humans affecting biogeous	lation fur and oxygen in an ecosystem nents and water in the biosphere nmunity and ecosystem structure			
Math Skills/ Science Processes	-Use of graphs - Creation and usage of data tables - Use of Graphing Calculators -graph of graphs and charts	,			
Assessments	-homework/class work -quiz -test -Inquiry lab on scientific method				
Interventions / differentiated instruction	-Provide advanced notice of tests -Include hands-on activities -Provide material at student's level of functioning -Use multi sensory approach				
Inter- disciplinary Connections	- Mathematical connections -Connection to English -Science and society -Scientific discoveries and the link to Ethics	;			

resou	- Hands-on activities -Laboratories related to the subject matter -Word processing systems -Computer access								
	2009 NJCCCS								
Stan	Standard:								
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Content Statement(s): CPI # /					/ CPI (s):				
	21st Century Themes								
	Global Awa	areness	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		
	21 st Century Skills								
	Creativity Innovat		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy		
	Media Literacy ICT Literacy Life and Career Skills					Skills			