### **Science 9 Standard**

**Curriculum Guide** 

**Dunmore School District** 

Dunmore, PA



#### **Science 9 Standard**

#### Prerequisite:

Successful completion of Science 8.

#### **Course Description:**

The Science 9 Standard course covers basic cell biology. Emphasis is on biological chemistry, cell structure and function, cellular metabolism, genetics, and other related topics. The course focuses on vocabulary building to prepare students for their sophomore Biology course and eventual success on the Biology Keystone Exam.

#### **Special Education:**

After a student has been evaluated and found to be eligible for specially designed instruction under one of the 13 disability categories, an individualized education plan will be developed to help the student succeed through a more intense intervention program. Special Education is the practice of educating students in a way that addresses their individual differences and needs. The purpose of special education is to provide equal access to education for children ages birth through 21 by providing specialized services that will lead to school success in general education. Our goal for each student is for him/her to be educated in his/her least restrictive environment with additional supports by way of specially designed instruction. After all interventions in the general education setting have been exhausted and the student is still not making progress, students can receive direct instruction in a special education classroom. Direct instruction provides more intense intervention and replacement instruction in order to minimize skill deficits. In our special education classrooms, students will have access to the standards-based general education curriculum, as well as using various research-based intervention programs. Resources and activities will be adjusted based on individual student needs. Suggested time found within the curriculum will be adjusted as needed per individual student's needs.

Special Education Strategies can be located in the IEP Enhancements table located in Appendix: A at the end of this document.

Year-at-a-glance

Subject: Science 9 Standard	Grade Level: 9	Date Completed: 4/8/2019
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1<sup>st</sup> Quarter: Introducing Biology

Topic	Resources	Standards
Biology in the 21st Century	Biology textbook	3.1.10.A
The Study of Life	PowerPoint presentations	3.3.10.B
Unifying Themes of Biology	Review Sheets	
Scientific Thinking and Processes	Vocab Quizzes	
Biologists' Tools and Technology	Content Exam	
Biology and Your Future		
Chemistry of Life	Biology textbook	3.3.10.A
Atoms, Ions, and Molecules	PowerPoint presentations	3.3.10.B
Properties of Water	Review Sheets	3.1.10.B
Carbon-Based Molecules	Vocab Quizzes	3.4.10.A
Chemical Reactions	Content Exam	3.4.10.B
Enzymes		
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### 2<sup>nd</sup> Quarter: Cells

Topic	Resources	Standards
Cell Structure and Function	Biology textbook	3.3.10.B
Cell Theory	PowerPoint presentations	3.3.10.A
Cell Organelles	Review Sheets	
Cell Membrane	Vocab Quizzes	
Diffusion and Osmosis	Content Exam	
Active Transport, Endocytosis, and Exocytosis		
Cells and Energy	Biology textbook	3.3.10.A
Chemical Energy and ATP	PowerPoint presentations	3.3.10.B
Overview of Photosynthesis	Review Sheets	3.4.10.A
Overview of Cell Respiration	Vocab Quizzes	3.1.12.E
Fermentation	Content Exam	3.4.10.B
		4.6.10.A
		4.6.10.B
		4.6.10.C

### 3<sup>rd</sup> Quarter: Genetics

Topic	Resources	Standards
Cell Growth and Division	Biology textbook	3.1.10.A
The Cell Cycle	PowerPoint presentations	3.3.10.C
Mitosis and Cytokinesis	Review Sheets	3.3.10.A
Regulation of the Cell Cycle	Vocab Quizzes	
Asexual Reproduction	Content Exam	
Multicellular life		
Meiosis and Mendel	Biology textbook	3.3.10.B
Chromosomes and Meiosis	PowerPoint presentations	3.3.10.C
Process of Meiosis	Review Sheets	
Mendel and Heredity	Vocab Quizzes	
Traits, Genes, and Alleles	Content Exam	
Traits and Probability		
Meiosis and Genetic Variation		
From DNA to Proteins	Biology textbook	3.3.10.A
Identifying DNA as the Genetic Material	PowerPoint presentations	3.3.10.B
Structure of DNA	Review Sheets	3.3.10.C
DNA Replication	Vocab Quizzes	
Transcription	Content Exam	
Translation		
Gene Expression and Regulation		
Mutations		

### 4<sup>th</sup> Quarter: Evolution

Topic	Resources	Standards
Principles of Evolution	Biology textbook	3.3.10.D
Early Ideas About Evolution	PowerPoint presentations	3.5.10.A
Darwin's Observations	Review Sheets	3.3.10.B
Theory of Natural Selection	Vocab Quizzes	4.7.10.C
Evidence of Evolution	Content Exam	
Evolutionary Biology Today		
The Evolution of Populations	Biology textbook	3.3.10.D
Genetic Variation Within Populations	PowerPoint presentations	3.3.10.C
Natural Selection in Populations	Review Sheets	4.7.10.C
Other Mechanisms of Evolution	Vocab Quizzes	
Speciation Through Isolation	Content Exam	
Patterns in Evolution		
Review and Final Exam		

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge, Skills & Vocabulary			Time (In Days)
Introduction to	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	15 days
Biology:	BIO.A.4.2 Explain mechanisms	BIO.A.4.2.1 Explain how	Chapter 1 sections 1	tests, quizzes, etc.	
All organisms are	that permit organisms to maintain	organisms maintain	and 2		
made of cells and	biological balance between their	homeostasis (e.g.,	PowerPoint	Series available	
can be	internal and external	thermoregulation, water	presentations	assessments online.	
characterized by	environments.	regulation, oxygen regulation).	Review sheets	(Optional)	
common aspects	BIO.A.4.1 Identify and describe	BIO.A.4.1.1 Describe how the	Vocabulary quizzes		
of their structure	the cell structures involved in	structure of the plasma	Content exam		
and functioning.	transport of materials into, out of,	membrane allows it to function			
_	and throughout a cell.	as a regulatory structure			
		and/or protective barrier for a			
	PA Academic Standards: Science	cell.			
	3.1.10.A Discriminate among the	BIO.A.4.1.2 Compare the			
	concepts of systems, subsystems,	mechanisms that transport			
	feedback and control in solving	materials across the plasma			
	technological problems.	membrane (i.e., passive			
	Identify the function of	transport—diffusion, osmosis,			
	subsystems within a larger system	facilitated diffusion; and active			
	(e.g., role of thermostat in an	transport—pumps,			
	engine, pressure switch).	endocytosis, exocytosis).			
	Describe the interrelationships				
	among inputs, processes, outputs,				
	feedback and control in specific	Essential Knowledge/Skills:			
	systems.	Biologists study life in all			
	• Explain the concept of system	forms. Unifying themes			
	redesign and apply it to improve	connect concepts from many			
	technological systems.	fields of biology.			
	Apply the universal systems				
	model to illustrate specific	Define and give examples of			
	solutions and troubleshoot	Earth's biodiversity.			

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specific problems.	Summarize the characteristics	
Analyze and describe the	that all living things share.	
effectiveness of systems to	olve Summarize four major unifying	
specific problems.	themes of biology. Give an	
3.3.10.B Describe and expla	n the example of each of the themes	
chemical and structural bas	s of of biology.	
living organisms.		
Describe the relationship	Vocabulary:	
between the structure of or	ganic Biosphere	
molecules and the function	they Biodiversity	
serve in living organisms.	Species	
Identify the specialized	Biology	
structures and regions of th	e cell Organism	
and the functions of each.	Cell	
Explain how cells store an	duse Metabolism	
information to guide their	DNA	
functions.	System	
Explain cell functions and	Ecosystem	
processes in terms of chem	cal Homeostasis	
reactions and energy chang	es. Evolution	
	Adaptation	
PA Core Standards:		
Reading for Science and Te	hnical	
Subjects, 6-12		
3.5 Reading Informational T	ext	
Students read, understand,		
respond to informational te		
with emphasis on comprehe		
making connections among		
and between texts with foc	is on	
textual evidence.		
PA Core Standards: Writing		
Science and Technical Subj	cts, 6-	
12		
3.6 Writing		

Studer	nts write for different		
purpos	ses and audiences.		
Studer	nts write clear and focused		
text to	convey a well-defined		
perspe	ective and appropriate		
conter	nt.		

<b>General Topic</b>	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge, Skills & Vocabulary			Time (In Days)
Chemistry of Life:	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	15 days
All organisms are	BIO.A.3.1 Identify and describe	BIO.A.3.1.1 Describe the	Chapter 2 section 3	tests, quizzes, etc.	
made of cells and	the cell structures involved in	fundamental roles of plastids	PowerPoint		
can be	processing energy.	(e.g., chloroplasts) and	presentations	Series available	
characterized by	BIO.A.3.2 Identify and describe	mitochondria in energy	Review sheets	assessments online.	
common aspects	how organisms obtain and	transformations.	Vocabulary quizzes	(Optional)	
of their structure	transform energy for their life	BIO.A.3.2.1 Compare the basic	Content exam		
and functioning.	processes.	transformation of energy			
		during photosynthesis and			
	PA Academic Standards: Science	cellular respiration.			
	3.3.10.A Explain the structural and	BIO.A.3.2.2 Describe the role			
	functional similarities and	of ATP in biochemical			
	differences found among living	reactions.			
	things.				
	Identify and characterize major				
	life forms according to their	Essential Knowledge/Skills:			
	placement in existing classification	Carbon-based molecules are			
	groups.	the foundation of life.			
	Explain the relationship	Sugar molecules are			
	between structure and function at	carbohydrates with			
	the molecular and cellular levels.	hydrocarbon backbones.			
	Describe organizing schemes of	These serve as the basis for			
	classification keys.	amino acids and other larger			
	Identify and characterize major	organic molecules needed by			
	life forms by kingdom, phyla, class	the cell.			
	and order.				
	3.3.10.B Describe and explain the	Describe the bonding			
	chemical and structural basis of	properties of carbon atoms.			
	living organisms.	Compare carbohydrates, lipids,			
	Describe the relationship	proteins, and nucleic acids.			
	between the structure of organic	proteins, and nacicie acids.			
	molecules and the function they	Vocabulary:			

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serv	ve in living organisms.	Monomer		!
• Ide	entify the specialized	Polymer		l
stru	ctures and regions of the cell	Carbohydrate		l
and	the functions of each.	Lipid		l
• Ex	plain how cells store and use	Fatty Acid		1
info	rmation to guide their	Protein		l
func	ctions.	Amino Acid		l
• Ex	plain cell functions and	Nucleic Acid		l
prod	cesses in terms of chemical			l
read	ctions and energy changes.			l
				l
PA	Core Standards:			l
Rea	ding for Science and Technical			l
Subj	jects, 6-12			l
3.5	Reading Informational Text			l
Stud	dents read, understand, and			l
resp	oond to informational text-			l
	n emphasis on comprehension,			l
	king connections among ideas			l
and	between texts with focus on			l
text	tual evidence.			l
				l
	Core Standards: Writing for			l
	ence and Technical Subjects, 6-			l
12				l
	Writing			l
	dents write for different			l
	poses and audiences.			l
	dents write clear and focused			
	to convey a well-defined			l
	spective and appropriate			l
cont	tent.			l
				ı

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge, Skills & Vocabulary			Time (In Days)
Chemistry of Life:	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	15 days
All organisms are	BIO.A.2.2 Describe and interpret	BIO.A.2.2.1 Explain how carbon	Chapter 2 sections 4 and	tests, quizzes, etc.	
made of cells and	relationships between structure	is uniquely suited to form	5		
can be	and function at various levels of	biological macromolecules.	PowerPoint	Series available	
characterized by	biochemical organization (i.e.,	BIO.A.2.2.2 Describe how	presentations	assessments online.	
common aspects	atoms, molecules, and	biological macromolecules	Review sheets	(Optional)	
of their structure	macromolecules).	form from monomers.	Vocabulary quizzes		
and functioning.	BIO.A.2.3 Explain how enzymes	Describe how biological	Content exam		
	regulate biochemical reactions	macromolecules form from			
	within a cell.	monomers.			
		BIO.A.2.2.3 Compare the			
	PA Academic Standards: Science	structure and function of			
	3.1.10.B Describe concepts of	carbohydrates, lipids, proteins,			
	models as a way to predict and	and nucleic acids in organisms.			
	understand science and	BIO.A.2.3.2 Explain how factors			
	technology.	such as pH, temperature, and			
	Distinguish between different	concentration levels can affect			
	types of models and modeling	enzyme function.			
	techniques and apply their	BIO.A.2.3.1 Describe the role			
	appropriate use in specific	of an enzyme as a catalyst in			
	applications (e.g., kinetic gas	regulating a specific			
	theory, DNA).	biochemical reaction.			
	• Examine the advantages of using	BIO.A.2.3.2 Explain how factors			
	models to demonstrate processes	such as pH, temperature, and			
	and outcomes (e.g., blue print	concentration levels can affect			
	analysis, structural stability).	enzyme function.			
	Apply mathematical models to				
	science and technology.				
	3.3.10.B Describe and explain the	Essential Knowledge/Skills:			
	chemical and structural basis of	Life depends on chemical			

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living organisms.	reactions. Chemical reactions	
Describe the relationship	are driven by matter and	
between the structure of organic	energy flowing through	
molecules and the function they	different organizational levels	
serve in living organisms.	of biological systems which	
<ul> <li>Identify the specialized</li> </ul>	form different products.	
structures and regions of the cell	Enzymes are catalysts for	
and the functions of each.	chemical reactions in living	
• Explain how cells store and use	things.	
information to guide their		
functions.	Describe how bonds break and	
Explain cell functions and	reform during chemical	
processes in terms of chemical	reactions. Explain why	
reactions and energy changes.	chemical reactions release or	
	absorb energy. Explain the	
3.4.10.A Explain concepts about	effect of a catalyst on	
the structure and properties of	activation energy. Describe	
matter.	how enzymes regulate	
<ul> <li>Know that atoms are composed</li> </ul>	chemical reactions.	
of even smaller sub-atomic		
structures whose properties are	Vocabulary:	
measurable.	Chemical reactant	
Explain the repeating pattern of	Reactant	
chemical properties by using the	Product	
repeating patterns of atomic	Bond Energy	
structure within the periodic	Equilibrium	
table.	Activation energy	
<ul> <li>Predict the behavior of gases</li> </ul>	Exothermic	
through the use of Boyle's,	Endothermic	
Charles' or the ideal gas law, in	Catalyst	
everyday situations.	Enzyme	
<ul> <li>Describe phases of matter</li> </ul>	Substrate	
according to the Kinetic Molecular		
Theory.		
Explain the formation of		

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compounds and their resulting			
properties using bonding theories			
(ionic and covalent).			
<ul> <li>Recognize formulas for simple</li> </ul>			
inorganic compounds.			
<ul> <li>Describe various types of</li> </ul>			
chemical reactions by applying the			
laws of conservation of mass and			
energy.			
<ul> <li>Apply knowledge of mixtures to</li> </ul>			
appropriate separation			
techniques.			
<ul> <li>Understand that carbon can</li> </ul>			
form several types of compounds.			
3.4.10.B Analyze energy sources			
and transfers of heat.			
<ul> <li>Determine the efficiency of</li> </ul>			
chemical systems by applying			
mathematical formulas.			
<ul> <li>Use knowledge of chemical</li> </ul>			
reactions to generate an electrical			
current.			
<ul> <li>Evaluate energy changes in</li> </ul>			
chemical reactions.			
<ul> <li>Use knowledge of conservation</li> </ul>			
of energy and momentum to			
explain common phenomena			
(e.g., refrigeration system, rocket			
propulsion).			
• Explain resistance, current and			
electro-motive force (Ohm's Law).			
PA Core Standards:			
Reading for Science and Technical			

Subjects, 6-12		
3.5 Reading Informational Text		
Students read, understand, and		
respond to informational text-		
with emphasis on comprehension,		
making connections among ideas		
and between texts with focus on		
textual evidence.		
PA Core Standards: Writing for		
Science and Technical Subjects, 6-		
12		
3.6 Writing		
Students write for different		
purposes and audiences.		
Students write clear and focused		
text to convey a well-defined		
perspective and appropriate		
content.		

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Cell Theory: All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	Anchor Descriptor: BIO.A.1.1 Explain the characteristics common to all organisms.  PA Academic Standards: Science 3.3.10.B Describe and explain the chemical and structural basis of living organisms.  • Describe the relationship between the structure of organic molecules and the function they serve in living organisms.  • Identify the specialized structures and regions of the cell and the functions of each.  • Explain how cells store and use information to guide their functions.  • Explain cell functions and processes in terms of chemical reactions and energy changes.  PA Core Standards: Reading for Science and Technical Subjects, 6-12 3.5 Reading Informational Text Students read, understand, and respond to informational textwith emphasis on comprehension,	Eligible Content: BIO.A.1.1.1 Describe the characteristics of life shared by all prokaryotic and eukaryotic organisms.  Essential Knowledge/Skills: Cells are the basic unit of life. Compare cellular structure and their functions in prokaryote and eukaryote cells.  Describe developments that lead to the cell theory. Differentiate between eukaryotic and prokaryotic cells.  Vocabulary: Cell theory Cytoplasm Organelle Prokaryotic cell Eukaryotic cell	Holt McDougal Biology: Chapter 3 section 1 PowerPoint presentations Review sheets Vocabulary quizzes Content exam	Teacher prepared tests, quizzes, etc.  Series available assessments online. (Optional)	5 days

making connections among ideas and between texts with focus on textual evidence.		
PA Core Standards: Writing for Science and Technical Subjects, 6- 12 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.		

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge, Skills & Vocabulary			Time (In Days)
Cell Organelles:	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	5 days
All organisms are	BIO.A.1.1 Explain the	BIO.A.1.1.1 Describe the	Chapter 3 section 2	tests, quizzes, etc.	
made of cells and	characteristics common to all	characteristics of life shared by	PowerPoint		
can be	organisms.	all prokaryotic and eukaryotic	presentations	Series available	
characterized by	BIO.A.1.2 Describe relationships	organisms.	Review sheets	assessments online.	
common aspects	between structure and function at	BIO.A.1.2.2 Describe and	Vocabulary quizzes	(Optional)	
of their structure	biological levels of organization.	interpret relationships	Content exam		
and functioning.		between structure and			
	PA Academic Standards: Science	function at various levels of			
	3.3.10.A Explain the structural and	biological organization (i.e.,			
	functional similarities and	organelles, cells, tissues,			
	differences found among living	organs, organ systems, and			
	things.	multicellular organisms).			
	Identify and characterize major				
	life forms according to their				
	placement in existing classification	Essential Knowledge/Skills:			
	groups.	Eukaryotic cells share many			
	Explain the relationship	similarities. Multicellular			
	between structure and function at	organisms have a hierarchical			
	the molecular and cellular levels.	structural organization, in			
	Describe organizing schemes of	which any one system is made			
	classification keys.	up of numerous parts and is			
	Identify and characterize major	itself a component of the next			
	life forms by kingdom, phyla, class	level.			
	and order.				
		Describe the internal structure			
	PA Core Standards:	of eukaryotic cells. Summarize			
	Reading for Science and Technical	the functions of organelles in			
	Subjects, 6-12	plant and animal cells.			
	3.5 Reading Informational Text	·			
	Students read, understand, and	Vocabulary:			
	respond to informational text-	Cytoskeleton			

with emphasis on comprehensio	n, Nucleus
making connections among idea	s Endoplasmic reticulum
and between texts with focus or	n Ribosomes
textual evidence.	Golgi apparatus
	Vesicle
PA Core Standards: Writing for	Mitochondrion
Science and Technical Subjects,	6- Vacuole
12	Lysosome
3.6 Writing	Centriole
Students write for different	Cell wall
purposes and audiences.	Chloroplast
Students write clear and focused	
text to convey a well-defined	
perspective and appropriate	
content.	

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
Cell Membrane	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	10 days
and Cell Transport:	BIO.A.2.1 Describe how the	BIO.A.2.1.1 Describe the	Chapter 3 sections 3, 4,	tests, quizzes, etc.	
All organisms are	unique properties of water	unique properties of water and	and 5		
made of cells and	support life on Earth.	how these properties support	PowerPoint	Series available	
can be	BIO.A.4.1 Identify and describe	life on Earth (e.g., freezing	presentations	assessments online.	
characterized by	the cell structures involved in	point, high specific heat,	Review sheets	(Optional)	
common aspects	transport of materials into, out of,	cohesion).	Vocabulary quizzes		
of their structure	and throughout a cell.	BIO.A.4.1.1 Describe how the	Content exam		
and functioning.		structure of the plasma			
	PA Academic Standards: Science	membrane allows it to function			
	3.3.10.B Describe and explain the	as a regulatory structure			
	chemical and structural basis of	and/or protective barrier for a			
	living organisms.	cell.			
	Describe the relationship	BIO.A.4.1.2 Compare the			
	between the structure of organic	mechanisms that transport			
	molecules and the function they	materials across the plasma			
	serve in living organisms.	membrane (i.e., passive			
	Identify the specialized	transport—diffusion, osmosis,			
	structures and regions of the cell	facilitated diffusion; and active			
	and the functions of each.	transport—pumps,			
	Explain how cells store and use	endocytosis, exocytosis).			
	information to guide their	BIO.A.4.1.3 Describe how			
	functions.	membrane-bound cellular			
	Explain cell functions and	organelles (e.g., endoplasmic			
	processes in terms of chemical	reticulum, Golgi apparatus)			
	reactions and energy changes.	facilitate the transport of			
		materials within a cell.			
	PA Core Standards:				
	Reading for Science and Technical				
	Subjects, 6-12	Essential Knowledge/Skills:			
	3.5 Reading Informational Text	Within cells, special structures			
	Students read, understand, and	are responsible for particular			

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respond to informational text	t- functions. The cell membrane		
with emphasis on compreher	nsion, is a barrier that separates a		
making connections among id	deas cell from the external		
and between texts with focus	s on <b>environment. Materials move</b>		
textual evidence.	across membranes because of		
	concentration differences.		
PA Core Standards: Writing f			
Science and Technical Subject	cts, 6- materials that cannot diffuse		
12	across a membrane.		
3.6 Writing			
Students write for different	Describe the structure of the		
purposes and audiences.	cell membrane. Summarize		
Students write clear and focu	9		
text to convey a well-defined			
perspective and appropriate			
content.	transport. Distinguish between		
	osmosis, diffusion, and		
	facilitated transport. Describe		
	active transport. Distinguish		
	among endocytosis,		
	phagocytosis, and exocytosis.		
	Vocabulary:		
	Cell membrane		
	Phospholipid		
	Fluid mosaic model		
	Selective permeability		
	Receptor		
	Passive transport		
	Diffusion		
	Concentration gradient		
	Osmosis		
	Isotonic		
	Hypertonic		
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Hypotonic

Facilitated diffusion	
Active transport	
Endocytosis	
Exocytosis	
Phagocytosis	

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
Photosynthesis:	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	5 days
All organisms are	BIO.A.3.1 Identify and describe	BIO.A.3.1.1 Describe the	Chapter 4 sections 2 and	tests, quizzes, etc.	
made of cells and	the cell structures involved in	fundamental roles of plastids	3		
can be	processing energy.	(e.g., chloroplasts) and	PowerPoint	Series available	
characterized by	BIO.A.3.2 Identify and describe	mitochondria in energy	presentations	assessments online.	
common aspects	how organisms obtain and	transformations.	Review sheets	(Optional)	
of their structure	transform energy for their life	BIO.A.3.2.1 Compare the basic	Vocabulary quizzes		
and functioning.	processes.	transformation of energy	Content exam		
		during photosynthesis and			
	PA Academic Standards: Science	cellular respiration.			
	3.3.10.A Explain the structural and	BIO.A.3.2.2 Describe the role			
	functional similarities and	of ATP in biochemical			
	differences found among living	reactions.			
	things.				
	<ul> <li>Identify and characterize major</li> </ul>				
	life forms according to their	Essential Knowledge/Skills:			
	placement in existing classification	Photosynthesis is the process			
	groups.	in which light energy is			
	Explain the relationship	transformed into chemical			
	between structure and function at	energy; carbon dioxide and			
	the molecular and cellular levels.	water react to form sugar and			
	<ul> <li>Describe organizing schemes of</li> </ul>	oxygen. The overall process of			
	classification keys.	photosynthesis produces			
	Identify and characterize major	sugars that store chemical			
	life forms by kingdom, phyla, class	energy. Photosynthesis			
	and order.	requires a series of chemical			
	3.3.10.B Describe and explain the	reactions.			
	chemical and structural basis of				
	living organisms.	Relate producers to			
	Describe the relationship	photosynthesis. Describe the			
	between the structure of organic	process of photosynthesis.			
	molecules and the function they	Describe the light-dependent			

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serve in li	ving organisms.	reactions in which energy is		
• Identify	the specialized	captured. Describe the light-		
structures	s and regions of the cell	independent reactions in		
and the fu	unctions of each.	which sugar is produced.		
• Explain	how cells store and use			
information	on to guide their	Vocabulary:		
functions.		Photosynthesis		
• Explain	cell functions and	Chlorophyll		
processes	in terms of chemical	Thylakoid		
reactions	and energy changes.	Light-dependent reactions		
3.4.10.A E	Explain concepts about	Light-independent reactions		
the struct	cure and properties of	Photosystem		
matter.		Electron transport chain		
• Know th	nat atoms are composed	ATP synthase		
of even sr	maller sub-atomic	Calvin cycle		
structures	s whose properties are			
measurab	ole.			
• Explain	the repeating pattern of			
chemical <sub>l</sub>	properties by using the			
repeating	patterns of atomic			
structure	within the periodic			
table.				
• Predict t	the behavior of gases			
through tl	he use of Boyle's,			
Charles' o	or the ideal gas law, in			
everyday	situations.			
• Describe	e phases of matter			
according	to the Kinetic Molecular			
Theory.				
• Explain	the formation of			
compound	ds and their resulting			
properties	s using bonding theories			
(ionic and	l covalent).			
Recogni	ze formulas for simple			
inorganic	compounds.			

	Curriculum Guide		
Describe various types of			
chemical reactions by applying the			
laws of conservation of mass and			
energy.			
<ul> <li>Apply knowledge of mixtures to</li> </ul>			
appropriate separation			
techniques.			
<ul> <li>Understand that carbon can</li> </ul>			
form several types of compounds.			
PA Core Standards:			
Reading for Science and Technical			
Subjects, 6-12			
3.5 Reading Informational Text			
Students read, understand, and			
respond to informational text-			
with emphasis on comprehension,			
making connections among ideas			
and between texts with focus on			
textual evidence.			
PA Core Standards: Writing for			
Science and Technical Subjects, 6-			
12			
3.6 Writing			
Students write for different			
purposes and audiences.			
Students write clear and focused			
text to convey a well-defined			
perspective and appropriate			
content.			

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
All organisms are	Anchor Descriptors:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	5 days
made of cells and	BIO.A.2.3 Explain how enzymes	BIO.A.2.3.1 Describe the role	Chapter 4 section 4	tests, quizzes, etc.	
can be	regulate biochemical reactions	of an enzyme as a catalyst in	PowerPoint		
characterized by	within a cell.	regulating a specific	presentations	Series available	
common aspects	BIO.A.3.1 Identify and describe	biochemical reaction.	Review sheets	assessments online.	
of their structure	the cell structures involved in	BIO.A.2.3.2 Explain how factors	Vocabulary quizzes	(Optional)	
and functioning.	processing energy.	such as pH, temperature, and	Content exam		
	BIO.A.3.2 Identify and describe	concentration levels can affect			
	how organisms obtain and	enzyme function.			
	transform energy for their life	BIO.A.3.1.1 Describe the			
	processes.	fundamental roles of plastids			
		(e.g., chloroplasts) and			
	PA Academic Standards: Science	mitochondria in energy			
	3.1.12.E Evaluate change in	transformations.			
	nature, physical systems and man-	BIO.A.3.2.1 Compare the basic			
	made systems.	transformation of energy			
	Evaluate fundamental science	during photosynthesis and			
	and technology concepts and their	cellular respiration.			
	development over time (e.g.,	BIO.A.3.2.2 Describe the role			
	DNA, cellular respiration, unified	of ATP in biochemical			
	field theory, energy	reactions.			
	measurement, automation,				
	miniaturization, Copernican and				
	Ptolemaic universe theories).	Essential Knowledge/Skills:			
	Analyze how models, systems	Energy flows through systems			
	and technologies have changed	by means of chemical			
	over time (e.g., germ theory,	reactions. Aerobic cellular			
	theory of evolution, solar system,	respiration involves a series of			
	cause of fire).	chemical reactions in which			
	Explain how correlation of	energy in food molecules can			
	variables does not necessarily	be converted into a form that			
	imply causation.	the cell can readily use for life			

T		Curriculum Guide		
	<ul> <li>Evaluate the patterns of change</li> </ul>	functions. The overall process		
	within a technology (e.g., changes	of cellular respiration converts		
	in engineering in the automotive	sugar into ATP using oxygen.		
	industry).			
		Describe the process of cellular		
	3.4.10.B Analyze energy sources	respiration. Compare cellular		
	and transfers of heat.	respiration to photosynthesis.		
	Determine the efficiency of			
	chemical systems by applying	Vocabulary:		
	mathematical formulas.	Cellular respiration		
	Use knowledge of chemical	Aerobic		
	reactions to generate an electrical	Glycolysis		
	current.	Anaerobic		
	<ul> <li>Evaluate energy changes in</li> </ul>	Krebs cycle		
	chemical reactions.			
	<ul> <li>Use knowledge of conservation</li> </ul>			
	of energy and momentum to			
	explain common phenomena			
	(e.g., refrigeration system, rocket			
	propulsion).			
	• Explain resistance, current and			
	electro-motive force (Ohm's Law).			
	PA Core Standards:			
	Reading for Science and Technical			
	Subjects, 6-12			
	3.5 Reading Informational Text			
	Students read, understand, and			
	respond to informational text-			
	with emphasis on comprehension,			
	making connections among ideas			
	and between texts with focus on			
	textual evidence.			
	PA Core Standards: Writing for			

Science and Technical Subjects, 6-		
12		
3.6 Writing		
Students write for different		
purposes and audiences.		
Students write clear and focused		
text to convey a well-defined		
perspective and appropriate		
content.		

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
All organisms are	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	5 days
made of cells and	BIO.A.2.3 Explain how enzymes	BIO.A.2.3.1 Describe the role	Chapter 4 section 5	tests, quizzes, etc.	
can be	regulate biochemical reactions	of an enzyme as a catalyst in	PowerPoint		
characterized by	within a cell.	regulating a specific	presentations	Series available	
common aspects	BIO.A.3.1 Identify and describe	biochemical reaction.	Review sheets	assessments online.	
of their structure	the cell structures involved in	BIO.A.2.3.2 Explain how factors	Vocabulary quizzes	(Optional)	
and functioning.	processing energy.	such as pH, temperature, and	Content exam		
	BIO.A.3.2 Identify and describe	concentration levels can affect			
	how organisms obtain and	enzyme function.			
	transform energy for their life	BIO.A.3.1.1 Describe the			
	processes.	fundamental roles of plastids			
		(e.g., chloroplasts) and			
	PA Academic Standards: Science	mitochondria in energy			
	3.1.12.E Evaluate change in	transformations.			
	nature, physical systems and man-	BIO.A.3.2.1 Compare the basic			
	made systems.	transformation of energy			
	<ul> <li>Evaluate fundamental science</li> </ul>	during photosynthesis and			
	and technology concepts and their	cellular respiration.			
	development over time (e.g.,				
	DNA, cellular respiration, unified				
	field theory, energy	Essential Knowledge/Skills:			
	measurement, automation,	Energy is transferred from one			
	miniaturization, Copernican and	system to another as a result			
	Ptolemaic universe theories).	of chemical reactions. Cellular			
	<ul> <li>Analyze how models, systems</li> </ul>	respiration is an aerobic			
	and technologies have changed	process with two main stages.			
	over time (e.g., germ theory,				
	theory of evolution, solar system,	Describe the process of			
	cause of fire).	glycolysis. Describe the details			
	<ul> <li>Explain how correlation of</li> </ul>	of the Krebs cycle and the			
	variables does not necessarily	electron transport chain.			
	imply causation.	,			

Curriculum duide					
	Evaluate the patterns of change	Vocabulary:			
	within a technology (e.g., changes	Electron transport chain			
	in engineering in the automotive	Chloroplast			
	industry).	Krebs cycle			
		Plastids			
	PA Core Standards:				
	Reading for Science and Technical				
	Subjects, 6-12				
	3.5 Reading Informational Text				
	Students read, understand, and				
	respond to informational text-				
	with emphasis on comprehension,				
	making connections among ideas				
	and between texts with focus on				
	textual evidence.				
	PA Core Standards: Writing for				
	Science and Technical Subjects, 6-				
	12				
	3.6 Writing				
	Students write for different				
	purposes and audiences.				
	Students write clear and focused				
	text to convey a well-defined				
	perspective and appropriate				
	content.				

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
All organisms are	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	5 days
made of cells and	BIO.A.3.2 Identify and describe	BIO.A.3.2.1 Compare the basic	Chapter 4 section 6	tests, quizzes, etc.	
can be	how organisms obtain and	transformation of energy	PowerPoint		
characterized by	transform energy for their life	during photosynthesis and	presentations	Series available	
common aspects	processes.	cellular respiration.	Review sheets	assessments online.	
of their structure		BIO.A.3.2.2 Describe the role	Vocabulary quizzes	(Optional)	
and functioning.	PA Academic Standards: Science	of ATP in biochemical	Content exam		
	3.3.10.B Describe and explain the	reactions.			
	chemical and structural basis of				
	living organisms.				
	Describe the relationship	Essential Knowledge/Skills:			
	between the structure of organic	Anaerobic (without oxygen)			
	molecules and the function they	cellular respiration follows a			
	serve in living organisms.	different and less efficient			
	Identify the specialized	chemical pathway to provide			
	structures and regions of the cell	energy in cells. Matter and			
	and the functions of each.	energy are conserved in each			
	• Explain how cells store and use	change. Fermentation allows			
	information to guide their	the production of a small			
	functions.	amount of ATP without			
	Explain cell functions and	oxygen.			
	processes in terms of chemical				
	reactions and energy changes.	Describe the process of			
		fermentation. Summarize the			
	PA Core Standards:	importance of fermentation.			
	Reading for Science and Technical				
	Subjects, 6-12	Vocabulary:			
	3.5 Reading Informational Text	Anaerobic			
	Students read, understand, and	Fermentation			
	respond to informational text-	Lactic acid			
	with emphasis on comprehension,				
	making connections among ideas				

and between texts with focus on textual evidence.		
PA Core Standards: Writing for Science and Technical Subjects, 6-12		
3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.		

<b>General Topic</b>	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
<b>Chemical Energy</b>	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	5 days
and ATP:	BIO.B.4.2 Describe interactions	BIO.B.4.2.1 Describe how	Chapter 4 section 1	tests, quizzes, etc.	
Organisms grow,	and relationships in an ecosystem.	energy flows through an	PowerPoint		
reproduce, and		ecosystem (e.g., food chains,	presentations	Series available	
perpetuate their	PA Academic Standards: Science	food webs, energy pyramids).	Review sheets	assessments online.	
species by	4.6.10.A Explain the biotic and		Vocabulary quizzes	(Optional)	
obtaining	abiotic components of an		Content exam		
necessary	ecosystem and their interaction.	Essential Knowledge/Skills:			
resources through	<ul> <li>Identify the major biomes and</li> </ul>	All cells need chemical			
interdependent	explain their similarities and	energy. Photosynthesis and			
relationships with	differences.	cellular respiration (including			
other organisms	<ul> <li>Compare and contrast the</li> </ul>	anaerobic processes) provide			
and the physical	interactions of biotic and abiotic	most of the energy for life			
environment.	components in an ecosystem.	processes.			
	<ul> <li>Analyze the effects of abiotic</li> </ul>				
	factors on specific ecosystems.	Recognize the importance of			
	<ul> <li>Describe how the availability of</li> </ul>	ATP as an energy-carrying			
	resources affects organisms in an	molecule. Identify energy			
	ecosystem.	sources used by organisms.			
	<ul> <li>Explain energy flow in a food</li> </ul>				
	chain through an energy pyramid.	Vocabulary:			
	<ul> <li>Evaluate the efficiency of energy</li> </ul>	ATP			
	flow in a food chain.	ADP			
	<ul> <li>Explain the concept of carrying</li> </ul>	Photosynthesis			
	capacity in an ecosystem.	Chemosynthesis			
	<ul> <li>Explain trophic levels.</li> </ul>	Cellular respiration			
	<ul> <li>Identify a specific environmental</li> </ul>	Fermentation			
	impact and predict what change				
	may take place to affect				
	homeostasis.				
	Examine and explain how				
	organisms modify their				

	Curriculum Guide		
environments to sustain their			
needs.			
Assess the effects of latitude and			
altitude on biomes.			
Interpret possible causes of			
population fluctuations.			
Explain how erosion and			
sedimentation have changed the			
quality of soil related habitats.			
4.6.10.B Explain how cycles affect			
the balance in an ecosystem.			
Describe an element cycle and			
its role in an ecosystem.			
Explain the consequences of			
interrupting natural cycles.			
4.6.10.C Analyze how ecosystems			
change over time.			
<ul> <li>Identify and explain the</li> </ul>			
succession stages in an ecosystem.			
• Identify causes of succession.			
<ul> <li>Analyze consequences of</li> </ul>			
interrupting natural cycles.			
Analyze how ecosystems change			
over time			
<ul> <li>Identify and explain the</li> </ul>			
succession stages in an ecosystem.			
• Identify causes of succession.			
Analyze consequences of			
interrupting natural cycles.			
Analyze how ecosystems change			
over time.			
Identify and explain the			
succession stages in an ecosystem.			

	Curriculum Guide		
<ul> <li>Identify causes of succession.</li> </ul>			
<ul> <li>Analyze consequences of</li> </ul>			
interrupting natural cycles.			
Analyze how ecosystems change			
over time.			
<ul> <li>Identify and explain the</li> </ul>			
succession stages in an ecosyster	n.		
<ul> <li>Identify causes of succession.</li> </ul>			
Analyze consequences of			
interrupting natural cycles.			
Analyze how ecosystems change			
over time.			
Identify and explain the			
succession stages in an ecosyster	n.		
<ul> <li>Identify causes of succession.</li> </ul>			
Analyze consequences of			
interrupting natural cycles.			
PA Core Standards:			
Reading for Science and Technica	al		
Subjects, 6-12			
3.5 Reading Informational Text			
Students read, understand, and			
respond to informational text-wit	h		
emphasis on comprehension,			
making connections among ideas			
and between texts with focus on			
textual evidence.			
PA Core Standards: Writing for			
Science and Technical Subjects, 6	j <b>-</b>		
12			
3.6 Writing			
Students write for different			
purposes and audiences. Studen	ts		

write clear and focused text to convey a well-defined perspective and appropriate content.		
and appropriate content.		

<b>General Topic</b>	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
All organisms are	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	5 days
made of cells and	BIO.B.1.2 Explain how genetic	BIO.B.1.2.1 Describe how the	Chapter 8 sections 1, 2,	tests, quizzes, etc.	
can be	information is inherited.	process of DNA replication	3, 4, and 5		
characterized by	BIO.B.2.2 Explain the process of	results in the transmission	PowerPoint	Series available	
common aspects	protein synthesis (i.e.,	and/or conservation of genetic	presentations	assessments online.	
of their structure	transcription, translation, and	information.	Review sheets	(Optional)	
and functioning.	protein modification).	BIO.B.1.2.2 Explain the	Vocabulary quizzes		
	BIO.B.4.1 Describe ecological	functional relationships	Content exam		
	levels of organization in the	between DNA, genes, alleles,			
	biosphere.	and chromosomes and their			
		roles in inheritance.			
	PA Academic Standards: Science	BIO.B.2.2.1 Describe how the			
	3.3.10.A Explain the structural and	processes of transcription and			
	functional similarities and	translation are similar in all			
	differences found among living	organisms.			
	things.	BIO.B.2.2.2 Describe the role of			
	<ul> <li>Identify and characterize major</li> </ul>	ribosomes, endoplasmic			
	life forms according to their	reticulum, Golgi apparatus,			
	placement in existing classification	and the nucleus in the			
	groups.	production of specific types of			
	Explain the relationship	proteins.			
	between structure and function at	BIO.A.4.1.3 Describe how			
	the molecular and cellular levels.	membrane-bound cellular			
	<ul> <li>Describe organizing schemes of</li> </ul>	organelles (e.g., endoplasmic			
	classification keys.	reticulum, Golgi apparatus)			
	<ul> <li>Identify and characterize major</li> </ul>	facilitate the transport of			
	life forms by kingdom, phyla, class	materials within a cell.			
	and order.				
	3.3.10.B Describe and explain the				
	chemical and structural basis of	Essential Knowledge/Skills:			
	living organisms.	DNA molecules contain			
	<ul> <li>Describe the relationship</li> </ul>	genetic information that is			

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	Daninore School Distric
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between the structure of organic	found in all cells. Genes are
molecules and the function they	sections of DNA that code for
serve in living organisms.	proteins, which are important
<ul> <li>Identify the specialized</li> </ul>	for cell functioning. DNA was
structures and regions of the cell	identified as the genetic
and the functions of each.	material through a series of
<ul> <li>Explain how cells store and use</li> </ul>	experiments. DNA structure is
information to guide their	the same in all organisms.
functions.	DNA replication copies the
<ul> <li>Explain cell functions and</li> </ul>	genetic information of a cell.
processes in terms of chemical	Transcription converts a gene
reactions and energy changes.	into a single-stranded RNA
	molecule. Translation converts
3.3.10.C Describe how genetic	an mRNA message into a
information is inherited and	polypeptide, or protein.
expressed.	
Compare and contrast the	Describe Griffith's discovery of
function of mitosis and meiosis.	a transforming principle.
<ul> <li>Describe mutations' effects on a</li> </ul>	Explain how Avery identified
trait's expression.	DNA as the transforming
<ul> <li>Distinguish different</li> </ul>	principle. Summarize the
reproductive patterns in living	experiments of Hershey and
things (e.g., budding, spores,	Chase that confirmed DNA as
fission).	the genetic material. Describe
<ul> <li>Compare random and selective</li> </ul>	the interaction of the four
breeding practices and their	nucleotides that make up DNA.
results (e.g., antibiotic resistant	Describe the three-
bacteria).	dimensional structure of DNA.
<ul> <li>Explain the relationship among</li> </ul>	Summarize the process of DNA
DNA, genes and chromosomes.	replication. Describe the role
<ul> <li>Explain different types of</li> </ul>	of enzymes in DNA replication.
inheritance (e.g., multiple allele,	Describe the relationship
sex-influenced traits).	between RNA and DNA.
Describe the role of DNA in	Identify the three kinds of RNA

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and their functions. Compare

protein synthesis as it relates to

	Curricularii Guluc		
gene expression.	transcription to replication.		
	Describe how mRNA codons		
PA Core Standards:	are translated into amino		
Reading for Science and Technical	acids. Summarize the process		
Subjects, 6-12	of protein synthesis.		
3.5 Reading Informational Text			
Students read, understand, and	Vocabulary:		
respond to informational text-	Bacteriophage		
with emphasis on comprehension,	Nucleotide		
making connections among ideas	Double helix		
and between texts with focus on	Base pairing rules		
textual evidence.	Replication		
	DNA polymerase		
PA Core Standards: Writing for	Central dogma		
Science and Technical Subjects, 6-	RNA		
12	Transcription		
3.6 Writing	RNA polymerase		
Students write for different	Messenger RNA (mRNA)		
purposes and audiences.	Ribosomal RNA (rRNA)		
Students write clear and focused	Transfer RNA (tRNA)		
text to convey a well-defined	Translation		
perspective and appropriate	Codon		
content.	Stop codon		
	Start codon		
	Anticodon		

<b>General Topic</b>	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
All organisms are	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	5 days
made of cells and	BIO.B.1.1 Describe the three	BIO.B.1.1.1 Describe the	Chapter 5 sections 1, 2,	tests, quizzes, etc.	
can be	stages of the cell cycle:	events that occur during the	and 3		
characterized by	interphase, nuclear division,	cell cycle: interphase, nuclear	PowerPoint	Series available	
common aspects	cytokinesis.	division (i.e., mitosis or	presentations	assessments online.	
of their structure		meiosis), cytokinesis.	Review sheets	(Optional)	
and functioning.	PA Academic Standards: Science	BIO.B.1.1.2 Compare the	Vocabulary quizzes		
	3.1.10.A Discriminate among the	processes and outcomes of	Content exam		
	concepts of systems, subsystems,	mitotic and meiotic nuclear			
	feedback and control in solving	divisions.			
	technological problems.				
	<ul> <li>Identify the function of</li> </ul>				
	subsystems within a larger system	Essential Knowledge/Skills:			
	(e.g., role of thermostat in an	Mitosis is the process in which			
	engine, pressure switch).	individual cells multiply, which			
	Describe the interrelationships	allows multicellular organisms			
	among inputs, processes, outputs,	to grow. Both daughter cells			
	feedback and control in specific	receive identical genetic			
	systems.	information from the original			
	Explain the concept of system	parent cell. Cells have distinct			
	redesign and apply it to improve	phases of growth,			
	technological systems.	reproduction, and normal			
	<ul> <li>Apply the universal systems</li> </ul>	functions. Cells divide during			
	model to illustrate specific	mitosis and cytokinesis. Cell			
	solutions and troubleshoot	cycle regulation is necessary			
	specific problems.	for healthy growth.			
	<ul> <li>Analyze and describe the</li> </ul>				
	effectiveness of systems to solve	Describe the stages of the cell			
	specific problems.	cycle. Compare rates of			
		division in different cell types.			
	3.3.10.C Describe how genetic	Identify factors that limit cell			
	information is inherited and	size. Describe the structure of			

		Curriculum Guide	 	
ехр	pressed.	a chromosome. Follow		
	Compare and contrast the	chromosomes through the		
fun	nction of mitosis and meiosis.	processes of mitosis and		
• D	Describe mutations' effects on a	cytokinesis. Identify internal		
tra	nit's expression.	and external factors that		
• D	Distinguish different	regulate cell division. Explain		
rep	productive patterns in living	cancer in terms of cell cycle.		
thi	ings (e.g., budding, spores,			
fiss	sion).	Vocabulary:		
• C	Compare random and selective	Cell cycle		
bre	eeding practices and their	Mitosis		
res	sults (e.g., antibiotic resistant	Cytokinesis		
bac	cteria).	Chromosome		
• E	Explain the relationship among	Histone		
DN	IA, genes and chromosomes.	Chromatin		
	Explain different types of	Chromatid		
inh	neritance (e.g., multiple allele,	Centromere		
sex	x-influenced traits).	Telomere		
• D	Describe the role of DNA in	Prophase		
pro	otein synthesis as it relates to	Metaphase		
ger	ne expression.	Anaphase		
		Telophase		
PA	Core Standards:	Growth Factor		
Rea	ading for Science and Technical	Apoptosis		
	bjects, 6-12	Cancer		
3.5	Reading Informational Text	Benign		
	udents read, understand, and	Malignant		
	spond to informational text-	Metastasize		
	th emphasis on comprehension,	Carcinogen		
	aking connections among ideas			
	d between texts with focus on			
	ktual evidence.			
	Core Standards: Writing for			
Scie	ience and Technical Subjects, 6-			
12				

3.6 Writing		
Students write for different		
purposes and audiences.		
Students write clear and focused		
text to convey a well-defined		
perspective and appropriate		
content.		

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
All organisms are	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	5 days
made of cells and	BIO.B.1.2 Explain how genetic	BIO.A.1.2.2 Describe and	Chapter 5 section 5	tests, quizzes, etc.	
can be	information is inherited.	interpret relationships	PowerPoint		
characterized by		between structure and	presentations	Series available	
common aspects	PA Academic Standards: Science	function at various levels of	Review sheets	assessments online.	
of their structure	3.3.10.A Explain the structural and	biological organization (i.e.,	Vocabulary quizzes	(Optional)	
and functioning.	functional similarities and	organelles, cells, tissues,	Content exam		
	differences found among living	organs, organ systems, and			
	things.	multicellular organisms).			
	<ul> <li>Identify and characterize major</li> </ul>				
	life forms according to their				
	placement in existing classification	Essential Knowledge/Skills:			
	groups.	Tissues and organs are			
	Explain the relationship	produced by cellular division			
	between structure and function at	and differentiation, and they			
	the molecular and cellular levels.	work together to meet a			
	<ul> <li>Describe organizing schemes of</li> </ul>	multicellular organism's			
	classification keys.	needs. Cells work together to			
	<ul> <li>Identify and characterize major</li> </ul>	carry out complex functions.			
	life forms by kingdom, phyla, class				
	and order.	Describe the specialization in			
		multicellular organisms.			
	3.3.10.C Describe how genetic	Identify different types of stem			
	information is inherited and	cells.			
	expressed.				
	Compare and contrast the	Vocabulary:			
	function of mitosis and meiosis.	Tissue			
	• Describe mutations' effects on a	Organ			
	trait's expression.	Organ system			
	Distinguish different	Cell differentiation			
	reproductive patterns in living	Stem cell			
	things (e.g., budding, spores,				

	Curriculum Guide		
fission).			
Compare random and selectiv	e		
breeding practices and their			
results (e.g., antibiotic resistant			
bacteria).			
Explain the relationship amon	3		
DNA, genes and chromosomes.			
Explain different types of			
inheritance (e.g., multiple allele			
sex-influenced traits).			
Describe the role of DNA in			
protein synthesis as it relates to			
gene expression.			
PA Core Standards:			
Reading for Science and Techni	cal		
Subjects, 6-12			
3.5 Reading Informational Text			
Students read, understand, and			
respond to informational text-			
with emphasis on comprehension	on,		
making connections among idea	s		
and between texts with focus of	ı		
textual evidence.			
PA Core Standards: Writing for			
Science and Technical Subjects	6-		
12			
3.6 Writing			
Students write for different			
purposes and audiences.			
Students write clear and focuse	d		
text to convey a well-defined			
perspective and appropriate			
content.			

<b>General Topic</b>	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
All organisms are	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	5 days
made of cells and	BIO.B.1.2 Explain how genetic	BIO.B.1.2.1 Describe how the	Chapter 6 sections 2	tests, quizzes, etc.	
can be	information is inherited.	process of DNA replication	PowerPoint		
characterized by	BIO.B.1.1 Describe the three	results in the transmission	presentations	Series available	
common aspects	stages of the cell cycle:	and/or conservation of genetic	Review sheets	assessments online.	
of their structure	interphase, nuclear division,	information.	Vocabulary quizzes	(Optional)	
and functioning.	cytokinesis.	BIO.B.1.1.2 Compare the	Content exam		
		processes and outcomes of			
	PA Academic Standards: Science	mitotic and meiotic nuclear			
	3.3.10.B Describe and explain the	divisions.			
	chemical and structural basis of				
	living organisms.				
	<ul> <li>Describe the relationship</li> </ul>	Essential Knowledge/Skills:			
	between the structure of organic	In sexual reproduction,			
	molecules and the function they	specialized cell division,			
	serve in living organisms.	meiosis, occurs resulting in			
	Identify the specialized	the production of sex cells			
	structures and regions of the cell	(sperm and egg cells).			
	and the functions of each.	Offspring inherit 23			
	<ul> <li>Explain how cells store and use</li> </ul>	chromosomes from each			
	information to guide their	parent resulting in 46 total			
	functions.	chromosomes. During meiosis,			
	<ul> <li>Explain cell functions and</li> </ul>	diploid cells undergo two cell			
	processes in terms of chemical	divisions that result in haploid			
	reactions and energy changes.	cells.			
	3.3.10.C Describe how genetic				
	information is inherited and	Compare and contrast the two			
	expressed.	rounds of division in meiosis.			
	Compare and contrast the	Describe how haploid cells			
	function of mitosis and meiosis.	develop into mature gametes.			

	Curriculum Guide		
Describe mutations' effects on a			
trait's expression.	Vocabulary:		
<ul> <li>Distinguish different</li> </ul>	Gametogenesis		
reproductive patterns in living	Spermatogenesis		
things (e.g., budding, spores,	Oogenesis		
fission).	Sperm		
<ul> <li>Compare random and selective</li> </ul>	Egg		
breeding practices and their	Polar body		
results (e.g., antibiotic resistant			
bacteria).			
Explain the relationship among			
DNA, genes and chromosomes.			
<ul> <li>Explain different types of</li> </ul>			
inheritance (e.g., multiple allele,			
sex-influenced traits).			
<ul> <li>Describe the role of DNA in</li> </ul>			
protein synthesis as it relates to			
gene expression.			
PA Core Standards:			
Reading for Science and Technical			
Subjects, 6-12			
3.5 Reading Informational Text			
Students read, understand, and			
respond to informational text-			
with emphasis on comprehension,			
making connections among ideas			
and between texts with focus on			
textual evidence.			
PA Core Standards: Writing for			
Science and Technical Subjects, 6-			
12			
3.6 Writing			
Students write for different			

purposes and audiences. Students write clear and focused		
text to convey a well-defined		
perspective and appropriate		
content.		

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
Heredity refers to	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	5 days
specific	BIO.B.1.2 Explain how genetic	BIO.B.1.2.2 Explain the	Chapter 6 sections 3 and	tests, quizzes, etc.	
mechanisms by	information is inherited.	functional relationships	4		
which		between DNA, genes, alleles,	PowerPoint	Series available	
characteristics or	PA Academic Standards: Science	and chromosomes and their	presentations	assessments online.	
traits are passed	3.3.10.C Describe how genetic	roles in inheritance.	Review sheets	(Optional)	
from one	information is inherited and		Vocabulary quizzes		
generation to the	expressed.		Content exam		
next via genes, and	Compare and contrast the	Essential Knowledge/Skills:			
explains why	function of mitosis and meiosis.	Each chromosome consists of			
offspring	• Describe mutations' effects on a	a single very long DNA			
resemble, but are	trait's expression.	molecule, and each gene on			
not identical to,	Distinguish different	the chromosome is a			
their parents.	reproductive patterns in living	particular segment of that			
	things (e.g., budding, spores,	DNA. The instructions for			
	fission).	forming species'			
	<ul> <li>Compare random and selective</li> </ul>	characteristics are carried in			
	breeding practices and their	DNA. Mendel's research			
	results (e.g., antibiotic resistant	showed that traits are			
	bacteria).	inherited as discrete units.			
	<ul> <li>Explain the relationship among</li> </ul>	Genes encode proteins that			
	DNA, genes and chromosomes.	produce a diverse range of			
	<ul> <li>Explain different types of</li> </ul>	traits.			
	inheritance (e.g., multiple allele,				
	sex-influenced traits).	Describe the pattern of			
	Describe the role of DNA in	inheritance that Mendel's data			
	protein synthesis as it relates to	revealed. Summarize Mendel's			
	gene expression.	law of segregation. Explain			
		how there can be many			
	PA Core Standards:	versions of one gene. Describe			
	Reading for Science and Technical	how genes influence the			
	Subjects, 6-12	development of traits.			

3.5 Reading Informational Text Students read, understand, and respond to informational text- with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.  PA Core Standards: Writing for Science and Technical Subjects, 6- 12 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate	Vocabulary: Trait Genetics Purebred Cross Law of segregation Gene Allele Homozygous Heterozygous Genome Genotype Phenotype Dominant Recessive		
•	Recessive		

<b>General Topic</b>	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
Heredity refers to	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	4 days
specific	BIO.B.2.1 Compare Mendelian and	BIO.B.2.1.2 Describe processes	Chapter 5 section 4	tests, quizzes, etc.	
mechanisms by	non-Mendelian patterns of	that can alter composition or	Chapter 6 section 1		
which	inheritance.	number of chromosomes (i.e.,	PowerPoint	Series available	
characteristics or		crossing-over, nondisjunction,	presentations	assessments online.	
traits are passed	PA Academic Standards: Science	duplication, translocation,	Review sheets	(Optional)	
from one	3.3.10.C Describe how genetic	deletion, insertion, and	Vocabulary quizzes		
generation to the	information is inherited and	inversion).	Content exam		
next via genes, and	expressed.				
explains why	Compare and contrast the				
offspring	function of mitosis and meiosis.	Essential Knowledge/Skills:			
resemble, but are	Describe mutations' effects on a	Many organisms reproduce by			
not identical to,	trait's expression.	cell division. The information			
their parents.	Distinguish different	passed from parents to			
	reproductive patterns in living	offspring is coded in the DNA			
	things (e.g., budding, spores,	molecules that form the			
	fission).	chromosomes. Gametes have			
	Compare random and selective	half the number of			
	breeding practices and their	chromosomes that body cells			
	results (e.g., antibiotic resistant	have.			
	bacteria).				
	Explain the relationship among	Compare and contrast binary			
	DNA, genes and chromosomes.	fission and mitosis. Describe			
	<ul> <li>Explain different types of</li> </ul>	how some eukaryotes			
	inheritance (e.g., multiple allele,	reproduce through mitosis.			
	sex-influenced traits).	Differentiate between body			
	Describe the role of DNA in	cells and gametes. Compare			
	protein synthesis as it relates to	and contrast autosomes and			
	gene expression.	sex chromosomes.			
	PA Core Standards:	Vocabulary:			
	Reading for Science and Technical	Asexual reproduction			
	Subjects, 6-12	Binary fission			

	3.5 Reading Informational Text	Somatic cell		
	Students read, understand, and	Gamete		
	respond to informational text-	Homologous chromosome		
	with emphasis on comprehension,	Autosome		
	making connections among ideas	Sex chromosome		
	and between texts with focus on	Sexual reproduction		
	textual evidence.	Fertilization		
		Diploid		
	PA Core Standards: Writing for	Haploid		
	Science and Technical Subjects, 6-	Meiosis		
	12			
	3.6 Writing			
	Students write for different			
	purposes and audiences.			
	Students write clear and focused			
	text to convey a well-defined			
	perspective and appropriate			
	content.			
-				

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
Heredity refers to	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	4 days
specific	BIO.B.2.1 Compare Mendelian and	BIO.B.2.1.2 Describe processes	Chapter 6 section 6	tests, quizzes, etc.	
mechanisms by	non-Mendelian patterns of	that can alter composition or	PowerPoint		
which	inheritance.	number of chromosomes (i.e.,	presentations	Series available	
characteristics or		crossing-over, nondisjunction,	Review sheets	assessments online.	
traits are passed	PA Academic Standards: Science	duplication, translocation,	Vocabulary quizzes	(Optional)	
from one	3.3.10.C Describe how genetic	deletion, insertion, and	Content exam		
generation to the	information is inherited and	inversion).			
next via genes, and	expressed.				
explains why	Compare and contrast the				
offspring	function of mitosis and meiosis.	Essential Knowledge/Skills:			
resemble, but are	• Describe mutations' effects on a	In sexual reproduction,			
not identical to,	trait's expression.	chromosomes can create new			
their parents.	Distinguish different	genetic combinations through			
	reproductive patterns in living	the process of meiosis, which			
	things (e.g., budding, spores,	creates new genetic			
	fission).	combinations and more			
	<ul> <li>Compare random and selective</li> </ul>	genetic variation.			
	breeding practices and their	Independent assortment and			
	results (e.g., antibiotic resistant	crossing over during meiosis			
	bacteria).	result in genetic diversity.			
	<ul> <li>Explain the relationship among</li> </ul>				
	DNA, genes and chromosomes.	Describe how sexual			
	<ul> <li>Explain different types of</li> </ul>	reproduction creates unique			
	inheritance (e.g., multiple allele,	gene combinations. Explain			
	sex-influenced traits).	how crossing over during			
	Describe the role of DNA in	meiosis increases genetic			
	protein synthesis as it relates to	diversity.			
	gene expression.	•			
		Vocabulary:			
	PA Core Standards:	Crossing-over			
	Reading for Science and Technical	Genetic linkage			

Subjects, 6-12	
3.5 Reading Informational Text	
Students read, understand, and	
respond to informational text-	
with emphasis on comprehension,	
making connections among ideas	
and between texts with focus on	
textual evidence.	
PA Core Standards: Writing for	
Science and Technical Subjects, 6-	
12	
3.6 Writing	
Students write for different	
purposes and audiences.	
Students write clear and focused	
text to convey a well-defined	
perspective and appropriate	
content.	

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
Heredity refers to	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	4 days
specific	BIO.B.2.1 Compare Mendelian and	BIO.B.2.1.2 Describe processes	Chapter 8 section 6	tests, quizzes, etc.	
mechanisms by	non-Mendelian patterns of	that can alter composition or	PowerPoint		
which	inheritance.	number of chromosomes (i.e.,	presentations	Series available	
characteristics or	BIO.B.2.3 Explain how genetic	crossing-over, nondisjunction,	Review sheets	assessments online.	
traits are passed	information is expressed.	duplication, translocation,	Vocabulary quizzes	(Optional)	
from one	BIO.B.2.4 Apply scientific thinking,	deletion, insertion, and	Content exam		
generation to the	processes, tools, and technologies	inversion).			
next via genes, and	in the study of genetics.	BIO.B.2.3.1 Describe how			
explains why		genetic mutations alter the			
offspring	PA Academic Standards: Science	DNA sequence and may or may			
resemble, but are	3.3.10.C Describe how genetic	not affect phenotype (e.g.,			
not identical to,	information is inherited and	silent, nonsense, frame-shift).			
their parents.	expressed.	BIO.B.2.4.1 Explain how			
	Compare and contrast the	genetic engineering has			
	function of mitosis and meiosis.	impacted the fields of			
	Describe mutations' effects on a	medicine, forensics, and			
	trait's expression.	agriculture (e.g., selective			
	Distinguish different	breeding, gene splicing,			
	reproductive patterns in living	cloning, genetically modified			
	things (e.g., budding, spores,	organisms, gene therapy).			
	fission).				
	Compare random and selective				
	breeding practices and their	Essential Knowledge/Skills:			
	results (e.g., antibiotic resistant	Although DNA replication is			
	bacteria).	tightly regulated and			
	Explain the relationship among	remarkably accurate, errors			
	DNA, genes and chromosomes.	do occur and result in			
	Explain different types of	mutations, which are also a			
	inheritance (e.g., multiple allele,	source of genetic variation.			
	sex-influenced traits).	Gene expression is carefully			
	Describe the role of DNA in	regulated in both prokaryotic			

			1	
protein synthesis as it relates to	and eukaryotic cells.			
gene expression.		1		
	Describe how prokaryotes turn			
PA Core Standards:	genes on and off. Explain how			
Reading for Science and Technical	gene expression is regulated in			
Subjects, 6-12	eukaryotic cells.			
3.5 Reading Informational Text				
Students read, understand, and	Vocabulary:			
respond to informational text-	Promoter			
with emphasis on comprehension,	Operon			
making connections among ideas	Exon			
and between texts with focus on	Intron			
textual evidence.				
PA Core Standards: Writing for				
Science and Technical Subjects, 6-				
12				
3.6 Writing				
Students write for different				
purposes and audiences.				
Students write clear and focused				
text to convey a well-defined				
perspective and appropriate				
content.				

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
Heredity refers to	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	4 days
specific	BIO.B.2.1 Compare Mendelian and	BIO.B.2.1.2 Describe processes	Chapter 8 section 7	tests, quizzes, etc.	
mechanisms by	non-Mendelian patterns of	that can alter composition or	PowerPoint		
which	inheritance.	number of chromosomes (i.e.,	presentations	Series available	
characteristics or	BIO.B.2.4 Apply scientific thinking,	crossing-over, nondisjunction,	Review sheets	assessments online.	
traits are passed	processes, tools, and technologies	duplication, translocation,	Vocabulary quizzes	(Optional)	
from one	in the study of genetics.	deletion, insertion, and	Content exam		
generation to the		inversion).			
next via genes, and	PA Academic Standards: Science	BIO.B.2.4.1 Explain how			
explains why	3.3.10.C Describe how genetic	genetic engineering has			
offspring	information is inherited and	impacted the fields of			
resemble, but are	expressed.	medicine, forensics, and			
not identical to,	Compare and contrast the	agriculture (e.g., selective			
their parents.	function of mitosis and meiosis.	breeding, gene splicing,			
	Describe mutations' effects on a	cloning, genetically modified			
	trait's expression.	organisms, gene therapy).			
	Distinguish different				
	reproductive patterns in living				
	things (e.g., budding, spores,	Essential Knowledge/Skills:			
	fission).	Environmental factors can			
	Compare random and selective	also cause mutations in genes,			
	breeding practices and their	and viable mutations are			
	results (e.g., antibiotic resistant	inherited. Mutations are			
	bacteria).	changes in DNA that may or			
	Explain the relationship among	may not affect phenotype.			
	DNA, genes and chromosomes.				
	Explain different types of	Distinguish between different			
	inheritance (e.g., multiple allele,	types of mutations. Explain			
	sex-influenced traits).	why mutations may or may not			
	Describe the role of DNA in	affect phenotype. List some			
	protein synthesis as it relates to	factors that cause mutations.			
	gene expression.				

		Vocabulary:		
	PA Core Standards:	Mutation		
	Reading for Science and Technical	Point mutation		
	Subjects, 6-12	Frameshift mutation		
3	3.5 Reading Informational Text	Mutagen		
	Students read, understand, and			
l l	respond to informational text-			
\	with emphasis on comprehension,			
1	making connections among ideas			
	and between texts with focus on			
t	textual evidence.			
1	PA Core Standards: Writing for			
	Science and Technical Subjects, 6-			
	12			
3	3.6 Writing			
9	Students write for different			
1	purposes and audiences.			
9	Students write clear and focused			
1	text to convey a well-defined			
	perspective and appropriate			
	content.			

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
Heredity refers to	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	4 days
specific	BIO.B.2.1 Compare Mendelian and	BIO.B.2.1.1 Describe and/or	Chapter 6 section 5	tests, quizzes, etc.	
mechanisms by	non-Mendelian patterns of	predict observed patterns of	PowerPoint		
which	inheritance.	inheritance (i.e., dominant,	presentations	Series available	
characteristics or	BIO.B.3.3 Apply scientific thinking,	recessive, co-dominance,	Review sheets	assessments online.	
traits are passed	processes, tools, and technologies	incomplete dominance, sex-	Vocabulary quizzes	(Optional)	
from one	in the study of the theory of	linked, polygenic, and multiple	Content exam		
generation to the	evolution.	alleles).			
next via genes, and		BIO.B.3.3.1 Distinguish			
explains why	PA Academic Standards: Science	between the scientific terms:			
offspring	3.3.10.C Describe how genetic	hypothesis, inference, law,			
resemble, but are	information is inherited and	theory, principle, fact, and			
not identical to,	expressed.	observation.			
their parents.	Compare and contrast the				
	function of mitosis and meiosis.				
	• Describe mutations' effects on a	Essential Knowledge/Skills:			
	trait's expression.	Environmental factors also			
	Distinguish different	affect expression of traits, and			
	reproductive patterns in living	hence affect the probability of			
	things (e.g., budding, spores,	occurrences of traits in a			
	fission).	population. The inheritance of			
	Compare random and selective	traits follows the rules of			
	breeding practices and their	probability.			
	results (e.g., antibiotic resistant				
	bacteria).	Describe monohybrid and			
	Explain the relationship among	dihybrid crosses. Explain how			
	DNA, genes and chromosomes.	heredity can be illustrated			
	Explain different types of	mathematically.			
	inheritance (e.g., multiple allele,				
	sex-influenced traits).	Vocabulary:			
	Describe the role of DNA in	Punnett square			
	protein synthesis as it relates to	Monohybrid cross			

gene expression. Testcross Dihybrid cross	
Dibybrid cross	
Dillybrid cross	
PA Core Standards: Law of independent	ent
Reading for Science and Technical assortment	
Subjects, 6-12 Probability	
3.5 Reading Informational Text	
Students read, understand, and	
respond to informational text-	
with emphasis on comprehension,	
making connections among ideas	
and between texts with focus on	
textual evidence.	
PA Core Standards: Writing for	
Science and Technical Subjects, 6-	
12	
3.6 Writing	
Students write for different	
purposes and audiences.	
Students write clear and focused	
text to convey a well-defined	
perspective and appropriate	
content.	

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
Biological	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	7 days
evolution explains	BIO.B.3.2 Analyze the sources of	BIO.B.3.2.1 Interpret evidence	Chapter 10 sections 4	tests, quizzes, etc.	
both the unity and	evidence for biological evolution.	supporting the theory of	and 5		
diversity of species	BIO.B.3.3 Apply scientific thinking,	evolution (i.e., fossil,	PowerPoint	Series available	
and provides a	processes, tools, and technologies	anatomical, physiological,	presentations	assessments online.	
unifying principle	in the study of the theory of	embryological, biochemical,	Review sheets	(Optional)	
for the history and	evolution.	and universal genetic code).	Vocabulary quizzes		
diversity of life on		BIO.B.3.3.1 Distinguish	Content exam		
Earth.	PA Academic Standards: Science	between the scientific terms:			
	3.3.10.D Explain the mechanisms	hypothesis, inference, law,			
	of the theory of evolution.	theory, principle, fact, and			
	• analyze data from fossil records,	observation.			
	similarities in anatomy and				
	physiology, embryological studies				
	and DNA studies that are relevant	Essential Knowledge/Skills:			
	to the theory of evolution.	Evidence of common ancestry			
	Explain the role of mutations	among species comes from			
	and gene recombination in	many sources. Evidence of			
	changing a population of	evolution is found in anatomy,			
	organisms.	heredity, embryology, and the			
	Compare modern day	fossil record. New technology			
	descendants of extinct species	is furthering our			
	and propose possible scientific	understanding of evolution.			
	accounts for their present				
	appearance.	Recognize the major sources of			
	<ul> <li>describe the factors (e.g.,</li> </ul>	evidence for evolution.			
	isolation, differential	Examine the pattern of			
	reproduction) affecting gene	features that reveal the history			
	frequency in a population over	of species. Summarize			
	time and their consequences.	different types of evidence			
	describe and differentiate	that support evolution.			
	between the roles of natural	Recognize the importance of			

 	Curriculum Guide		
selection and genetic drift.	evolution in unifying all		
<ul> <li>Describe changes that illustrate</li> </ul>	branches of biological study.		
major events in the earth's			
development based on a time	Vocabulary:		
line.	Biogeography		
<ul> <li>explain why natural selection</li> </ul>	Homologous structure		
can act only on inherited traits.	Analogous structure		
<ul> <li>Apply the concept of natural</li> </ul>	Vestigial structure		
selection to illustrate and account	Paleontology		
for a species' survival, extinction			
or change over time.			
3.5.10.A Relate earth features and			
processes that change the earth.			
<ul> <li>Illustrate and explain plate</li> </ul>			
tectonics as the mechanism of			
continental movement and sea			
floor changes.			
<ul> <li>Compare examples of change to</li> </ul>			
the earth's surface over time as			
they related to continental			
movement and ocean basin			
formation (e.g., Delaware,			
Susquehanna, Ohio Rivers system			
formations, dynamics).			
<ul> <li>Interpret topographic maps to</li> </ul>			
identify and describe significant			
geologic history/structures in			
Pennsylvania.			
<ul> <li>Evaluate and interpret geologic</li> </ul>			
history using geologic maps.			
<ul> <li>Explain several methods of</li> </ul>			
dating earth materials and			
structures.			
<ul> <li>Correlate rock units with general</li> </ul>			

	Curriculum Guide		
geologic time periods in the history of the earth.			
Describe and identify major			
types of rocks and minerals.			
PA Core Standards:			
Reading for Science and Technical			
Subjects, 6-12			
3.5 Reading Informational Text			
Students read, understand, and			
respond to informational text-			
with emphasis on comprehension,			
making connections among ideas			
and between texts with focus on			
textual evidence.			
PA Core Standards: Writing for			
Science and Technical Subjects, 6-			
12			
3.6 Writing			
Students write for different			
purposes and audiences.			
Students write clear and focused			
text to convey a well-defined			
perspective and appropriate			
content.			

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
Biological	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	7 days
evolution explains	BIO.B.3.1 Explain the mechanisms	BIO.B.3.1.1 Explain how	Chapter 11 section 2	tests, quizzes, etc.	
both the unity and	of evolution.	natural selection can impact	PowerPoint		
diversity of species	BIO.B.3.3 Apply scientific thinking,	allele frequencies of a	presentations	Series available	
and provides a	processes, tools, and technologies	population.	Review sheets	assessments online.	
unifying principle	in the study of the theory of	BIO.B.3.3.1 Distinguish	Vocabulary quizzes	(Optional)	
for the history and	evolution.	between the scientific terms:	Content exam		
diversity of life on		hypothesis, inference, law,			
Earth.	PA Academic Standards: Science	theory, principle, fact, and			
	3.3.10.D Explain the mechanisms	observation.			
	of the theory of evolution.				
	<ul> <li>analyze data from fossil records,</li> </ul>				
	similarities in anatomy and	Essential Knowledge/Skills:			
	physiology, embryological studies	Natural selection occurs only			
	and DNA studies that are relevant	if there is both a variation in			
	to the theory of evolution.	the genetic information			
	Explain the role of mutations	between organisms in a			
	and gene recombination in	population and a variation in			
	changing a population of	the expression of that genetic			
	organisms.	information (trait variation)			
	Compare modern day	that leads to differences in			
	descendants of extinct species	performance among			
	and propose possible scientific	individuals. Populations, not			
	accounts for their present	individuals, evolve.			
	appearance.	-			
	<ul> <li>describe the factors (e.g.,</li> </ul>	Describe how natural selection			
	isolation, differential	acts on traits in a population.			
	reproduction) affecting gene	Explain three ways natural			
	frequency in a population over	selection can change the			
	time and their consequences.	distribution of a trait in a			
	describe and differentiate	population.			
	between the roles of natural				

# Dunmore School District

Curriculum Guide					
	selection and genetic drift.	Vocabulary:			
	<ul> <li>Describe changes that illustrate</li> </ul>	Normal distribution			
	major events in the earth's	Microevolution			
	development based on a time	Directional selection			
	line.	Stabilizing selection			
	<ul> <li>explain why natural selection</li> </ul>	Disruptive selection			
	can act only on inherited traits.				
	<ul> <li>Apply the concept of natural</li> </ul>				
	selection to illustrate and account				
	for a species' survival, extinction				
	or change over time.				
	PA Core Standards:				
	Reading for Science and Technical				
	Subjects, 6-12				
	3.5 Reading Informational Text				
	Students read, understand, and				
	respond to informational text-				
	with emphasis on comprehension,				
	making connections among ideas				
	and between texts with focus on				
	textual evidence.				
	PA Core Standards: Writing for				
	Science and Technical Subjects, 6-				
	12 2.6 Weiting				
	3.6 Writing Students write for different				
	purposes and audiences.				
	Students write clear and focused				
	text to convey a well-defined				
	perspective and appropriate				
	content.				
	Content.				
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<b>General Topic</b>	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
Biological	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	7 days
evolution explains	BIO.B.3.1 Explain the mechanisms	BIO.B.3.1.1 Explain how	Chapter 11 sections 1, 3,	tests, quizzes, etc.	
both the unity and	of evolution.	natural selection can impact	and 5		
diversity of species	BIO.B.3.3 Apply scientific thinking,	allele frequencies of a	PowerPoint	Series available	
and provides a	processes, tools, and technologies	population.	presentations	assessments online.	
unifying principle	in the study of the theory of	BIO.B.3.3.1 Distinguish	Review sheets	(Optional)	
for the history and	evolution.	between the scientific terms:	Vocabulary quizzes		
diversity of life on		hypothesis, inference, law,	Content exam		
Earth.	PA Academic Standards: Science	theory, principle, fact, and			
	3.3.10.C Describe how genetic	observation.			
	information is inherited and				
	expressed.				
	<ul> <li>Compare and contrast the</li> </ul>	Essential Knowledge/Skills:			
	function of mitosis and meiosis.	The traits that positively affect			
	• Describe mutations' effects on a	survival are more likely to be			
	trait's expression.	reproduced, and thus are			
	Distinguish different	more common in the			
	reproductive patterns in living	population. A population			
	things (e.g., budding, spores,	shares a common gene pool.			
	fission).	Natural selection is not the			
	<ul> <li>Compare random and selective</li> </ul>	only mechanism through			
	breeding practices and their	which populations evolve.			
	results (e.g., antibiotic resistant	New species can arise when			
	bacteria).	populations are isolated.			
	Explain the relationship among				
	DNA, genes and chromosomes.	Describe the significance of			
	Explain different types of	genetic variation within a			
	inheritance (e.g., multiple allele,	population. Identify sources of			
	sex-influenced traits).	genetic variation. Explain how			
	Describe the role of DNA in	gene flow, genetic drift, and			

		Curriculum Guide		
pr	rotein synthesis as it relates to	sexual selection can lead to the		
ge	ene expression.	evolution of populations.		
		Explain how isolation of		
3.	.3.10.D Explain the mechanisms	populations can lead to		
of	f the theory of evolution.	speciation. Describe how		
•	analyze data from fossil records,	populations can become		
Si	milarities in anatomy and	isolated.		
pl	hysiology, embryological studies			
ar	nd DNA studies that are relevant	Vocabulary:		
to	the theory of evolution.	Gene pool		
•	Explain the role of mutations	Allele frequency		
ar	nd gene recombination in	Gene flow		
ch	hanging a population of	Genetic drift		
Or	rganisms.	Bottleneck effect		
•	Compare modern day	Founder effect		
de	escendants of extinct species	Sexual selection		
ar	nd propose possible scientific	Reproductive isolation		
ac	ccounts for their present	Speciation		
ar	ppearance.	Behavioral isolation		
•	describe the factors (e.g.,	Geographic isolation		
iso	olation, differential	Temporal isolation		
re	eproduction) affecting gene			
fre	equency in a population over			
tiı	me and their consequences.			
•	describe and differentiate			
be	etween the roles of natural			
se	election and genetic drift.			
	Describe changes that illustrate			
m	najor events in the earth's			
de	evelopment based on a time			
lir	ne.			
•	explain why natural selection			
ca	an act only on inherited traits.			
•	Apply the concept of natural			
se	election to illustrate and account			

	<u>.                                      </u>			
	for a species' survival, extinction			
	or change over time.			
	PA Core Standards:			
	Reading for Science and Technical			
	Subjects, 6-12			
	3.5 Reading Informational Text			
	Students read, understand, and			
	respond to informational text-			
	with emphasis on comprehension,			
	making connections among ideas			
	and between texts with focus on			
	textual evidence.			
	PA Core Standards: Writing for			
	Science and Technical Subjects, 6-			
	12			
	3.6 Writing			
	Students write for different			
	purposes and audiences.			
	Students write clear and focused			
	text to convey a well-defined			
	perspective and appropriate			
	content.			
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General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
Biological	Anchor Descriptor:	Eligible Content:	Holt McDougal Biology:	Teacher prepared	7 days
evolution explains	BIO.B.3.1 Explain the	BIO.B.3.1.1 Explain how	Chapter 10 section 3	tests, quizzes, etc.	
both the unity and	mechanisms of evolution.	natural selection can impact	PowerPoint		
diversity of species		allele frequencies of a	presentations	Series available	
and provides a	PA Academic Standards: Science	population.	Review sheets	assessments online.	
unifying principle	3.3.10.B Describe and explain the		Vocabulary quizzes	(Optional)	
for the history and	chemical and structural basis of		Content exam		
diversity of life on	living organisms.	Essential Knowledge/Skills:			
Earth.	<ul> <li>Describe the relationship</li> </ul>	Darwin proposed natural			
	between the structure of organic	selection as a mechanism for			
	molecules and the function they	evolution. Natural selection is			
	serve in living organisms.	the result of four factors: (1)			
	Identify the specialized	the potential for a species to			
	structures and regions of the cell	increase in number, (2) the			
	and the functions of each.	genetic variation of			
	Explain how cells store and use	individuals in a species due to			
	information to guide their	mutation and sexual			
	functions.	reproduction, (3) competition			
	Explain cell functions and	for an environment's limited			
	processes in terms of chemical	supply of the resources, and			
	reactions and energy changes.	(4) the increase in number of			
		those organisms that are			
	3.3.10.D Explain the mechanisms	better able to survive and			
	of the theory of evolution.	reproduce in that			
	• analyze data from fossil records,	environment.			
	similarities in anatomy and				
	physiology, embryological studies	Compare artificial selection to			
	and DNA studies that are relevant	natural selection. Examine the			
	to the theory of evolution.	factors Darwin considered in			
	Explain the role of mutations	forming his theory of natural			
	and gene recombination in	selection. Summarize the four			
	changing a population of	principles of natural selection.			

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organisms.			
Compare modern da	•		
descendants of extinct			
and propose possible s	-		
accounts for their pres	ent Natural selection		
appearance.	Population		
<ul> <li>describe the factors</li> </ul>	e.g., Fitness		
isolation, differential			
reproduction) affecting			
frequency in a populat			
time and their consequ			
describe and differer			
between the roles of n			
selection and genetic of	rift.		
Describe changes that			
major events in the ea			
development based or	a time		
line.			
explain why natural s			
can act only on inherit			
Apply the concept of			
selection to illustrate a			
for a species' survival,	extinction		
or change over time.			
PA Core Standards:			
Reading for Science ar	d Technical		
Subjects, 6-12			
3.5 Reading Information			
Students read, underst			
respond to information			
with emphasis on com			
making connections ar	_		
and between texts wit	n focus on		

	Carriculatii Galac		
textual evidence.			
PA Core Standards: Writing for			
Science and Technical Subjects, 6-			
12			
3.6 Writing			
Students write for different			
purposes and audiences.			
Students write clear and focused			
text to convey a well-defined			
perspective and appropriate			
content.			

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge, Skills & Vocabulary			Time (In Days)
Biological evolution	Anchor Descriptor:	Eligible Content:	Holt McDougal	Teacher prepared tests,	7 days
explains both the	BIO.B.3.2 Analyze the sources of	BIO.B.3.2.1 Interpret evidence	Biology:	quizzes, etc.	
unity and diversity	evidence for biological evolution.	supporting the theory of	Chapter 10 sections 1		
of species and	BIO.B.3.3 Apply scientific thinking,	evolution (i.e., fossil,	and 2	Series available	
provides a unifying	processes, tools, and technologies	anatomical, physiological,	Chapter 11 section 6	assessments online.	
principle for the	in the study of the theory of	embryological, biochemical,	PowerPoint	(Optional)	
history and	evolution.	and universal genetic code).	presentations		
diversity of life on		BIO.B.3.3.1 Distinguish	Review sheets		
Earth.	PA Academic Standards: Science	between the scientific terms:	Vocabulary quizzes		
	3.3.10.D Explain the mechanisms	hypothesis, inference, law,	Content exam		
	of the theory of evolution.	theory, principle, fact, and			
	<ul> <li>analyze data from fossil records,</li> </ul>	observation.			
	similarities in anatomy and				
	physiology, embryological studies				
	and DNA studies that are relevant	Essential Knowledge/Skills:			
	to the theory of evolution.	There were theories of			
	<ul> <li>Explain the role of mutations</li> </ul>	biological and geologic change			
	and gene recombination in	before Darwin. Darwin's			
	changing a population of	voyage provided insights into			
	organisms.	evolution. Natural selection			
	Compare modern day	leads to adaptations.			
	descendants of extinct species	·			
	and propose possible scientific	Examine early ideas about			
	accounts for their present	evolution. Identify three			
	appearance.	geological theories that			
	<ul> <li>describe the factors (e.g.,</li> </ul>	influenced scientific debate			
	isolation, differential	over evolution. Describe how			
	reproduction) affecting gene	Darwin arrived at his idea			
	frequency in a population over	about species variation.			
	time and their consequences.	Recognize how Darwin's			

	Curriculum Guide		
describe and differentiate	discoveries supported Lyell's		
between the roles of natural	Ancient-Earth theory.		
selection and genetic drift.			
<ul> <li>Describe changes that illustrate</li> </ul>			
major events in the earth's	Vocabulary:		
development based on a time	Evolution		
line.	Species		
<ul> <li>explain why natural selection</li> </ul>	Fossil		
can act only on inherited traits.	Catastrophism		
<ul> <li>Apply the concept of natural</li> </ul>	Gradualism		
selection to illustrate and account	Uniformitarianism		
for a species' survival, extinction	Variation		
or change over time.	Adaptation		
4.7.10.C Identify and explain why			
adaptations can lead to			
specialization.			
Explain factors that could lead			
to a species' increase or decrease.			
Explain how management			
practices may influence the			
success of specific species.			
Identify and explain criteria used			
by scientists for categorizing			
organisms as threatened,			
endangered or extinct.			
DA Com Standards			
PA Core Standards:			
Reading for Science and Technical			
Subjects, 6-12			
3.5 Reading Informational Text			
Students read, understand, and			
respond to informational text-			
with emphasis on comprehension,			
making connections among ideas			

	and between texts with focus on extra levidence.	
S	PA Core Standards: Writing for Science and Technical Subjects, 6-	
1	12	
s r s t	8.6 Writing Students write for different curposes and audiences. Students write clear and focused ext to convey a well-defined cerspective and appropriate content.	

General Topic	Anchor Descriptor	Eligible Content,	Resources & Activities	Assessments	Suggested
	PA Academic and Core Standards	Essential Knowledge,			Time
		Skills & Vocabulary			(In Days)
<b>Review and Final</b>					10 days
Exam					

#### **PA Core Standards:**

Reading for Science and Technical Subjects, 6-12

## 3.5 Reading Informational Text

Students read, understand, and respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.

#### Grades 9-10

#### CC.3.5.9-10.A.

Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

### CC.3.5.9-10.B.

Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.

### CC.3.5.9-10.C.

Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

#### CC.3.5.9-10.D.

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

### CC.3.5.9-10.E.

Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).

#### CC.3.5.9-10.F.

Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address.

#### CC.3.5.9-10.G.

Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

#### CC.3.5.9-10.H.

Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.

#### CC.3.5.9-10.I.

Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

#### CC.3.5.9-10.J.

By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently.

#### **Grades 11-12**

#### CC.3.5.11-12.A.

Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

#### CC.3.5.11-12.B.

Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

#### CC.3.5.11-12.C.

Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

#### CC.3.5.11-12.D.

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

#### CC.3.5.11-12.E.

Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

#### CC.3.5.11-12.F.

Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.

### CC.3.5.11-12.G.

Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

### CC.3.5.11-12.H.

Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.

## CC.3.5.11-12.I.

Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

#### CC.3.5.11-12.J.

By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently.

### **PA Core Standards:**

Writing for Science and Technical Subjects, 6-12

### 3.6 Writing

Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.

#### Grades 9-10

#### CC.3.6.9-10.A.

Write arguments focused on discipline-specific content.

- Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.
- Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.
- Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
- Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
- Provide a concluding statement or section that follows from or supports the argument presented.

### CC.3.6.9-10B. \*

Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

- Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
- Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.
- Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.
- Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.
- Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
- Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).

#### CC.3.6.9-10.C.

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

#### CC.3.6.9-10.D.

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience

#### CC.3.6.9-10.E.

Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

#### CC.3.6.9-10.F.

Conduct short as well as more sustained research projects to answer a question (including a selfgenerated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

#### CC.3.6.9-10.G.

Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

#### CC.3.6.9-10.H.

Draw evidence from informational texts to support analysis, reflection, and research.

#### CC.3.6.9-10.I.

Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

#### **Grades 11-12**

#### CC.3.6.11-12.A.

Write arguments focused on discipline-specific content.

• Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.

- Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.
- Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
- Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
- Provide a concluding statement or section that follows from or supports the argument presented.

CC.3.6.11-12. B \*Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

- Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
- Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.
- Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.
- Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.
- Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications
  or the significance of the topic)

#### CC.3.6.11-12.C.

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

#### CC.3.6.11-12.D.

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

#### CC.3.6.11-12.E.

Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

#### CC.3.6.11-12.F.

Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

### CC.3.6.11-12.G.

Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.

#### CC.3.6.11-12.H.

Draw evidence from informational texts to support analysis, reflection, and research.

## CC.3.6.11-12.I.

Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

	Append	dix: A			
IEP Enhancements					
General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:		
Introduction to Biology: All organisms are made of cells and can be characterized by common aspects of their structure and functioning.  Biologists study life in all forms. Unifying themes connect concepts from many fields of biology.	<ul> <li>Preferential Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:      Adapted in accordance to the student's IEP     Extended time to complete  Suggested Time: 15 days as specified in curriculum with additional time as needed per individual student		

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
Chemistry of Life: All organisms are made of cells and can be characterized by common aspects of their structure and functioning.  Carbon-based molecules are the foundation of life.  Sugar molecules are carbohydrates with hydrocarbon backbones. These serve as the basis for amino acids and other larger organic molecules needed by the cell.	Preferential Seating Use of computer when available Interactive Online Videos Visual Aids Highlighter Breaking tasks down into more manageable units Breaking directions down, with one direction given at a time Use of a calculator when applicable Frequent breaks to maintain focus Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined Extra time to complete assignments Additional textbooks sent home Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material Sample problems provided Directions read aloud		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 15 days as specified in curriculum with additional time as needed per individual student
Chemistry of Life: All organisms are made of cells and can be characterized by common aspects of their structure and functioning. Life depends on chemical reactions. Chemical reactions are driven by matter and energy flowing through different organizational levels of biological systems which form different products. Enzymes are catalysts for chemical reactions in living things.	<ul> <li>Preferential Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 15 days as specified in curriculum with additional time as needed per individual student

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
Cell Theory: All organisms are made of cells and can be characterized by common aspects of their structure and functioning.  Cells are the basic unit of life. Compare cellular structure and their functions in prokaryote and eukaryote cells.	<ul> <li>Preferential s Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 5 days as specified in curriculum with additional time as needed per individual student
Cell Organelles: All organisms are made of cells and can be characterized by common aspects of their structure and functioning.  Eukaryotic cells share many similarities. Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.	<ul> <li>Preferential Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 5 days as specified in curriculum with additional time as needed per individual student

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
Cell Membrane and Cell Transport: All organisms are made of cells and can be characterized by common aspects of their structure and functioning.  Within cells, special structures are responsible for particular functions. The cell membrane is a barrier that separates a cell from the external environment.  Materials move across membranes because of concentration differences. Cells use energy to transport materials that cannot diffuse across a membrane.	<ul> <li>Preferential Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time:  10 days as specified in curriculum with additional time as needed per individual student
Photosynthesis: All organisms are made of cells and can be characterized by common aspects of their structure and functioning.  Photosynthesis is the process in which light energy is transformed into chemical energy; carbon dioxide and water react to form sugar and oxygen. The overall process of photosynthesis produces sugars that store chemical energy.  Photosynthesis requires a series of chemical reactions.	Preferential Seating Use of computer when available Interactive Online Videos Visual Aids Highlighter Breaking tasks down into more manageable units Breaking directions down, with one direction given at a time Use of a calculator when applicable Frequent breaks to maintain focus Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined Extra time to complete assignments Additional textbooks sent home Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material Sample problems provided Directions read aloud		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 5 days as specified in curriculum with additional time as needed per individual student

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.  Energy flows through systems by means of chemical reactions. Aerobic cellular respiration involves a series of chemical reactions in which energy in food molecules can be converted into a form that the cell can readily use for life functions. The overall process of cellular respiration converts sugar into ATP using oxygen.	Preferential Seating Use of computer when available Interactive Online Videos Visual Aids Highlighter Breaking tasks down into more manageable units Breaking directions down, with one direction given at a time Use of a calculator when applicable Frequent breaks to maintain focus Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined Extra time to complete assignments Additional textbooks sent home Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material Sample problems provided Directions read aloud		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 5 days as specified in curriculum with additional time as needed per individual student
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.  Energy is transferred from one system to another as a result of chemical reactions. Cellular respiration is an aerobic process with two main stages.	Preferential Seating Use of computer when available Interactive Online Videos Visual Aids Highlighter Breaking tasks down into more manageable units Breaking directions down, with one direction given at a time Use of a calculator when applicable Frequent breaks to maintain focus Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined Extra time to complete assignments Additional textbooks sent home Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material Sample problems provided Directions read aloud		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 5 days as specified in curriculum with additional time as needed per individual student

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.  Anaerobic (without oxygen) cellular respiration follows a different and less efficient chemical pathway to provide energy in cells. Matter and energy are conserved in each change. Fermentation allows the production of a small amount of ATP without oxygen.	Preferential Seating Use of computer when available Interactive Online Videos Visual Aids Highlighter Breaking tasks down into more manageable units Breaking directions down, with one direction given at a time Use of a calculator when applicable Frequent breaks to maintain focus Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined Extra time to complete assignments Additional textbooks sent home Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material Sample problems provided Directions read aloud		Assessments:      Adapted in accordance to the student's IEP     Extended time to complete  Suggested Time: 5 days as specified in curriculum with additional time as needed per individual student
Chemical Energy and ATP: Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.  All cells need chemical energy. Photosynthesis and cellular respiration (including anaerobic processes) provide most of the energy for life processes.	<ul> <li>Preferential s Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 5 days as specified in curriculum with additional time as needed per individual student

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.  DNA molecules contain genetic information that is found in all cells. Genes are sections of DNA that code for proteins, which are important for cell functioning. DNA was identified as the genetic material through a series of experiments. DNA structure is the same in all organisms. DNA replication copies the genetic information of a cell. Transcription converts a gene into a single-stranded RNA molecule. Translation converts an mRNA message into a polypeptide, or protein.	Preferential Seating Use of computer when available Interactive Online Videos Visual Aids Highlighter Breaking tasks down into more manageable units Breaking directions down, with one direction given at a time Use of a calculator when applicable Frequent breaks to maintain focus Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined Extra time to complete assignments Additional textbooks sent home Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material Sample problems provided Directions read aloud		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 5 days as specified in curriculum with additional time as needed per individual student
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.  Mitosis is the process in which individual cells multiply, which allows multicellular organisms to grow. Both daughter cells receive identical genetic information from the original parent cell. Cells have distinct phases of growth, reproduction, and normal functions. Cells divide during mitosis and cytokinesis. Cell cycle regulation is necessary for healthy growth.	Preferential Seating Use of computer when available Interactive Online Videos Visual Aids Highlighter Breaking tasks down into more manageable units Breaking directions down, with one direction given at a time Use of a calculator when applicable Frequent breaks to maintain focus Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined Extra time to complete assignments Additional textbooks sent home Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material Sample problems provided Directions read aloud		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 5 days as specified in curriculum with additional time as needed per individual student

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.  Tissues and organs are produced by cellular division and differentiation, and they work together to meet a multicellular organism's needs. Cells work together to carry out complex functions.	<ul> <li>Preferential Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:      Adapted in accordance to the student's IEP     Extended time to complete  Suggested Time: 5 days as specified in curriculum with additional time as needed per individual student
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.  In sexual reproduction, specialized cell division, meiosis, occurs resulting in the production of sex cells (sperm and egg cells). Offspring inherit 23 chromosomes from each parent resulting in 46 total chromosomes. During meiosis, diploid cells undergo two cell divisions that result in haploid cells.	<ul> <li>Preferential Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:      Adapted in accordance to the student's IEP     Extended time to complete  Suggested Time: 5 days as specified in curriculum with additional time as needed per individual student

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.  Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA. The instructions for forming species' characteristics are carried in DNA. Mendel's research showed that traits are inherited as discrete units. Genes encode proteins that produce a diverse range of traits.	<ul> <li>Preferential Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 5 days as specified in curriculum with additional time as needed per individual student
Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.  Many organisms reproduce by cell division. The information passed from parents to offspring is coded in the DNA molecules that form the chromosomes. Gametes have half the number of chromosomes that body cells have.	<ul> <li>Preferential Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 4 days as specified in curriculum with additional time as needed per individual student

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.  In sexual reproduction, chromosomes can create new genetic combinations through the process of meiosis, which creates new genetic combinations and more genetic variation. Independent assortment and crossing over during meiosis result in genetic diversity.	<ul> <li>Preferential Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 4 days as specified in curriculum with additional time as needed per individual student
Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.  Although DNA replication is tightly regulated and remarkably accurate, errors do occur and result in mutations, which are also a source of genetic variation. Gene expression is carefully regulated in both prokaryotic and eukaryotic cells.	<ul> <li>Preferential Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 4 days as specified in curriculum with additional time as needed per individual student

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.  Environmental factors can also cause mutations in genes, and viable mutations are inherited. Mutations are changes in DNA that may or may not affect phenotype.	<ul> <li>Preferential Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter when applicable</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:      Adapted in accordance to the student's IEP     Extended time to complete  Suggested Time: 4 days as specified in curriculum with additional time as needed per individual student
Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.  Environmental factors also affect expression of traits, and hence affect the probability of occurrences of traits in a population. The inheritance of traits follows the rules of probability.	<ul> <li>Preferential Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:      Adapted in accordance to the student's IEP     Extended time to complete  Suggested Time: 4 days as specified in curriculum with additional time as needed per individual student

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.  Evidence of common ancestry among species comes from many sources.  Evidence of evolution is found in anatomy, heredity, embryology, and the fossil record. New technology is furthering our understanding of evolution.	<ul> <li>Preferential Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 7 days as specified in curriculum with additional time as needed per individual student
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.  Natural selection occurs only if there is both a variation in the genetic information between organisms in a population and a variation in the expression of that genetic information (trait variation) that leads to differences in performance among individuals.  Populations, not individuals, evolve.	<ul> <li>Preferential Seating</li> <li>Use of computer when available</li> <li>Interactive Online Videos</li> <li>Visual Aids</li> <li>Highlighter</li> <li>Breaking tasks down into more manageable units</li> <li>Breaking directions down, with one direction given at a time</li> <li>Use of a calculator when applicable</li> <li>Frequent breaks to maintain focus</li> <li>Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined</li> <li>Extra time to complete assignments</li> <li>Additional textbooks sent home</li> <li>Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material</li> <li>Sample problems provided</li> <li>Directions read aloud</li> </ul>		Assessments:      Adapted in accordance to the student's IEP     Extended time to complete  Suggested Time: 7 days as specified in curriculum with additional time as needed per individual student

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.  The traits that positively affect survival are more likely to be reproduced, and thus are more common in the population. A population shares a common gene pool. Natural selection is not the only mechanism through which populations evolve. New species can arise when populations are isolated.	Preferential Seating Use of computer when available Interactive Online Videos Visual Aids Highlighter Breaking tasks down into more manageable units Breaking directions down, with one direction given at a time Use of a calculator when applicable Frequent breaks to maintain focus Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined Extra time to complete assignments Additional textbooks sent home Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material Sample problems provided Directions read aloud		Assessments:  • Adapted in accordance to the student's IEP • Extended time to complete  Suggested Time: 7 days as specified in curriculum with additional time as needed per individual student
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.  Darwin proposed natural selection as a mechanism for evolution. Natural selection is the result of four factors: (1) the potential for a species to increase in number, (2) the genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for an environment's limited supply of the resources, and (4) the increase in number of those organisms that are better able to survive and reproduce in that environment.	Preferential Seating Use of computer when available Interactive online videos Visual Aids Highlighter Breaking tasks down into more manageable units Breaking directions down, with one direction given at a time Use of a calculator when applicable Frequent breaks to maintain focus Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined Extra time to complete assignments Additional textbooks sent home Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material Sample problems provided Directions read aloud		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 7 days as specified in curriculum with additional time as needed per individual student

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.  There were theories of biological and geologic change before Darwin. Darwin's voyage provided insights into evolution. Natural selection leads to adaptations.	Preferential Seating Use of computer when available Interactive Online Videos Visual Aids Highlighter Breaking tasks down into more manageable units Breaking directions down, with one direction given at a time Use of a calculator when applicable Frequent breaks to maintain focus Modified assignments-examples (not limited to): less problems on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined Extra time to complete assignments Additional textbooks sent home Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material Sample problems provided Directions read aloud		Assessments:  • Adapted in accordance to the student's IEP  • Extended time to complete  Suggested Time: 7 days as specified in curriculum with additional time as needed per individual student
Review and Final Exam	As listed above		