Middle School Life Science engages you in studying the transformation from molecules to organisms, ecosystems, heredity, and biological evolution. Key concepts addressed in this course include:

- All organisms are made of cells and can be characterized by common aspects of their structure and functioning.

- Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.

- 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.

- Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.

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Module I: From Molecules to Organisms: Structures and Processes	In this module you will explore that all organisms are made of cells and can be characterized by common aspects of their structure and functioning. You will also learn that organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment. **Module I Essential Questions**: • How do organisms live, grow, and respond to their environment, and reproduce? • How and why do organisms interact with their environment, and what are the effects of these interactions? • How are the characteristics of one generation passed to the next? How can individuals of the same species, and even siblings, have different characteristics? • How can there be so many similarities among organisms, yet so many different kinds of plants, animals, and microorganisms? **3.1.7.A1.** **3.1.7.A2.** **3.1.7.A4.** **3.1.7.A5.** **3.1.7.A6.** **3.1.7.B1.** **3.1.7.B2.**				
Heredity and DNA	In this lesson, you will learn about the basics of heredity and the role DNA plays in inherited traits. 3.1.7.B1.	**IDENTIFY** the basics of heredity.	http://learn.genetics.utah.edu/content/inheritance/intro/	What is Heredity - Tour of the Basics	
		EXPLORE DNA and the role it plays in determining how our bodies function and what traits we have.	http://learn.genetics.utah.edu/content/inheritance/traits/	Genetics: Tour of the Basics	
		DEMONSTRATE how cells function.	https://itunes.apple.com/us/app/comic-star-hd-comic-strip/id924459189?mt=8	CHOOSE a group of specialized cells and CREATE a four panel comic strip. The strip should show the cells doing their job in a funny and accurate way.	

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Structure and Function	In this lesson, you will explore cells, the smallest unit that can be said to be alive. You will learn about the make-up of a cell and cell functions. 3.1.7.A4. 3.1.7.A5. 3.1.7.A6.	LEARN about cells and their functions.	https://itunes.apple.com/us/book/e.-o.-wilsons-life-on-earth/id888118327?mt=11		
		OBSERVE the functions of cells.	http://youtu.be/gFuEo2ccTPA	Intro to cells video	
		EXPLORE and INTERACT with the makeup of cells.	http:www.cellsalive.com	CELLS alive - website -	
		LEARN about the functions of molecules and organisms.	https://itunes.apple.com/us/book/from-molecules-to-organisms/id862173694?mt=11	iTunes - workbook/video - From Molecules to Organisms: Structures and Processes, Gary Hubbs	
		LEARN and INTERACT in the process of mitosis.	https://itunes.apple.com/us/app/animal-histology-lite/id461431898?mt=8		
		INTERACT and **INVESTIGATE** the animal cells. **SUMMARIZE** the function of a cell as a whole and ways parts of cells contribute to the function.	https://itunes.apple.com/us/app/cell-world/id873302906?mt=8	Cell World App	
		SUMMARIZE the function of a cell as a whole and ways parts of cells contribute to the function. CREATE an explanatory video.	https://itunes.apple.com/us/app/cell-world/id873302906?mt=8	Cell World App	

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Growth and Development of Organisms	In this lesson, you will explore how organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. 3.1.7.B2.	**PLACE** the life cycle of insects in order.	https://itunes.apple.com/us/app/animals-life-cycle-insects/id658736303?mt=8		
		LEARN about the life cycle of frogs.	https://itunes.apple.com/us/app/life-cycle-of-the-frog/id827625635?mt=8		
		IDENTIFY the reproductive stages of a flower.	https://www.youtube.com/watch?v=0UEpq1W9C_E		
		EXPLORE plant growth and reproduction.	https://www.youtube.com/watch?v=V5yya4elRLw		
		SIMULATE the process of the plant cycle. CREATE a poster to model understanding.	https://itunes.apple.com/us/app/glogster/id907433564?mt=8		
Organization for Matter and Energy Flow in Organisms	In this lesson, you will learn how plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. 3.1.7.A2.	**LEARN** about the process of photosynthesis.	https://www.khanacademy.org/video/photosynthesis	Khan Academy App or	
		LEARN about the global carbon cycle.	https://itunes.apple.com/us/podcast/the-energy-cycle/id380231245?i=84486683&mt=2		
		EXPLAIN the plant's role in the carbon cycle. CREATE a presentation using a photograph of a plant.	https://itunes.apple.com/us/app/chatterpix-by-duck-duck-moose/id734038526?mt=8		

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		DESCRIBE how enzymes affect the rate of a reaction by observing simulation catalyst reaction.	http://www.phschool.com/atschool/phbio/active_art/enzyme_action/index.html		
		COMPARE and **CONTRAST** actual photosynthesis to artificial photosynthesis.	http://abcnews.go.com/blogs/technology/2013/06/chemist-hopes-artificial-leaf-can-power-civilization-using-photosynthesis/		
Information Processing	In this lesson, you will learn how each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain.	**LEARN about** the three sensory inputs: electromagnetic, mechanical, chemical, citing examples of these inputs with others.	https://www.youtube.com/watch?v=W4N-7AlzK7s		
		EXPLORE the brain and nervous system.	https://itunes.apple.com/us/app/finr-brain-atlas/id424850167?mt=8	https://docs.google.com/document/d/1pkaQVQdGzBE6NzKQrsWIYtLT5CZYxgQFMZ	
		LABEL the major parts of the nervous system.	https://itunes.apple.com/us/app/explain-everything-interactive/id431493086?mt=8		

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Module 2: Ecosystems: Interactions, Energy, and Dynamics	In this module you will explore and learn how organisms interact with their environment and how these interactions effect both the organisms and it's environment. You will also learn about heredity and how one generation's traits are passed to the next.				
	Module II Essential Questions: How do organisms live, grow, respond to their environment, and reproduce? How and why do organisms interact with their environment and what are the effects of these interactions? How are the characteristics of one generation passed to the next? How can individuals of the same species, and even siblings, have different characteristics? How can there be so many similarities among organisms, yet so many different kinds of plants, animals, and microorganisms? 3.1.7.A8 4.1.7.A 4.1.7.C 4.1.7.D				
Interdependent Relationships in Ecosystems	In this lesson, you will explore that organisms and populations of organisms are dependent on their environmental interactions both with other living things and with nonliving factors. Growth of organisms and population increases are limited by access to resources (food, water, oxygen). You will also find the patterns of interactions between organisms within their environments, both living and nonliving, are shared.	**IDENTIFY and DESCRIBE** living thing found in your environment.	https://itunes.apple.com/us/app/biokids/id509242921?mt=8		
		DISCOVER and **RESEARCH** about a living thing.	https://itunes.apple.com/us/app/wikipedia-mobile/id324715238?mt=8		
		DEFINE what make up an ecosystem.	https://itunes.apple.com/us/course/what-is-an-ecosystem/id583749360?i=125649601&mt=2		
		ASSESS your knowledge of vocabulary regarding interactions among organisms.	http://quizlet.com/_u8wzz		
		EXAMINE the relationship between predator and prey.	https://itunes.apple.com/us/podcast/predators-and-prey/id642572666?i=155614215&mt=2		

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		DETERMINE where an animal lives on map.	https://itunes.apple.com/us/app/biodiversity-is-us/id868781934?mt=8		
Cycles of Matter and Energy Transfer in Ecosystems	In this lesson, you will explore that food webs are models that demonstrate how matter and energy are transferred between producers (generally plants and other organisms that engage in photosynthesis), consumers, and decomposers as the three groups interact—primarily for food—within an ecosystem. You will also look at how decomposers recycle matter from dead plants and animals, and their waste, back to the soil and atmosphere in terrestrial environments or to the water in aquatic environments. And how the matter in an ecosystem is constantly cycled between organisms (living parts) and their environment (nonliving parts).	**LEARN about** energy flow through an ecosystem.	https://itunes.apple.com/us/podcast/the-energy-cycle/id380231245?i=84486683&mt=2		
		CREATE and EXPLORE food webs.	https://itunes.apple.com/us/app/food-web/id565839214?mt=8		
		FILL in the energy flow diagram.	https://drive.google.com/file/d/0B99Um_mvTWdGSVd0SWU2cTh3LUE/view?usp=sharing		
		LEARN about the global carbon cycle.	https://itunes.apple.com/us/podcast/carbon-cycle-global-warming/id261246615?i=29188421&mt=2		
		DISCOVER how you can cut carbon emissions to prevent global warming.	https://itunes.apple.com/us/app/offset/id895952566?mt=8		
		CREATE diagram that explains the carbon cycle.	https://itunes.apple.com/us/app/glogster/id907433564?mt=8		

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Ecosystem Dynamics, Functioning, and Resilience	In this lesson, you will explore that ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all of its populations. Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health.	**LEARN** how biodiversity and ecosystems are important for sustaining life.	https://itunes.apple.com/us/book/e.-o.-wilsons-life-on-earth/id888491533?mt=13	READ the pages 8-12 in Life on Earth	
		EXPLORE facts about biodiversity.	http://www.pbs.org/wnet/nature/the-loneliest-animals-web-exclusive-video-the-importance-of-biodiversity/4942/		
		DESCRIBE how the biodiversity of either a forest or marsh is a measure of the Earth's good health. CREATE a presentation to share your findings.	https://itunes.apple.com/us/app/tellagami/id572737805?mt=8		
		INVESTIGATE ways that you can protect biodiversity.	https://itunes.apple.com/us/app/biodiversity-is-us/id868781934?mt=8	Information found in the "Action to Help" section.	

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Module 3: Heredity: Inheritance and Variation of Traits	In this module, you will focus on four big ideas of life science: All organisms are made of cells and can be characterized by common aspects of their structure and functioning. Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment. 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. Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth. 3.1.7.B1 3.1.7.B2 3.1.7.B4 3.1.7.C1 3.1.7.C2 4.5.7.D 4.5.8.D				
	Module III Essential Questions: How do organisms live, grow, respond to their environment, and reproduce? How and why do organisms interact with their environment and what are the effects of these interactions? How are the characteristics of one generation passed to the next? How can individuals of the same species and even siblings have different characteristics? How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?				
Inheritance of Traits	In this lesson, you will discover the role of genes and how they affect the traits of the individual (e.g., human skin color results from the actions of proteins that control the production of the pigment melanin) and how sexual reproduction transmits genetic information to offspring through egg and sperm cells.	DEFINE the genetic terms.	https://itunes.apple.com/us/app/talking-glossary-genetics/id596245582?mt=8		
		LEARN the basics of heredity.	http://learn.genetics.utah.edu/content/inheritance/intro/		
		LEARN about inherited traits and recessive/ dominant genes.	http://studyjams.scholastic.com/studyjams/jams/science/human-body/heredity.htm		
		DISCOVER AND ASSESS your knowledge of DNA.	http://www.kidsknowit.com/interactive-educational-movies/free-online-movies.php?movie=DNA		

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		LEARN about chromosomes, including where they are located, how they are inherited, and the effect they have on an offspring.	https://itunes.apple.com/us/app/gene-screen/id447754230?mt=8		
		EXPLAIN how an offspring's traits depend on recessive and dominant genes.	http://www.pbslearningmedia.org/resource/hew06.sci.life.gen.dominantgene/some-genes-are-dominant/		
		DEMONSTRATE how each parent contributes half of the genes acquired by the offspring.	https://itunes.apple.com/us/app/gene-screen/id447754230?mt=8		
		DEMONSTRATE how an offspring can inherit specific traits by breeding parents who possess both recessive and dominant genes for those traits.	http://pbskids.org/dragonflytv/games/game_dogbreeding.html		
		EXPLAIN how an offspring inherits chromosomes using a Punnett Square as you CREATE a presentation to share your understanding.	https://itunes.apple.com/us/app/showme-interactive-whiteboard/id445066279?mt=8		
Variation of Traits	In this lesson, you will learn about sexually reproducing organisms and how each parent contributes half of the genes acquired by the offspring.	**DISCOVER** how genetic mutations occur.	http://evolution.berkeley.edu/evolibrary/article/0_0_0/mutations_04	http://www.watchknowlearn.org/Video.aspx?VideoID=3492&CategoryID=2741	
		LEARN how genetic mutations can be inherited by an offspring.	https://itunes.apple.com/us/app/gene-screen/id447754230?mt=8		
		RESEARCH at least two types of genetic diseases.	https://itunes.apple.com/us/app/gene-screen/id447754230?mt=8		

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		EXPLAIN one type of genetic disease, including causes, symptoms, and treatments. CREATE a poster to share your understanding.	https://itunes.apple.com/us/app/glogster/id907433564?mt=8		
		DEFINE genetic engineering.	http://tiki.oneworld.org/genetics/home.html		
		RESEARCH how genetic engineering can benefit the world's population.	http://www.iptv.org/exploremore/ge/uses/index.cfm		
		EXPLAIN how genetic engineering can be beneficial. CREATE a presentation to share your understanding.	https://itunes.apple.com/us/app/tellagami/id572737805?mt=8		

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Module IV: Biological Evolution: Unity and Diversity	In this Module, you will learn that the process of evolution primarily results from four factors; the potential for a species to increase in number, the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, competition for limited resources, and the proliferation of those organisms that are better able to survive and reproduce in the environment. 3.1.7.B1 3.1.7.C1 3.1.7.C2 3.1.7.C3					
	Module IV Essential Questions: **How organisms effect one another in different ecosystems?** **How do fossils help understand the history of the earth?** **How and why do organisms change and adapt over time?**					
Interdependent Relationships	In this lesson, you will explore symbiotic and parasitic relationships of organisms in an ecosystem.	**UNDERSTAND** interdependent relationships.	https://www.youtube.com/watch?v=vFqv_y1QKRA			
		COMPARE symbiotic and parasitic relationships in organisms within an ecosystem.	www.slideshare.net/emneistadt/ecology-symbiotic-relationships?related=1			
		DEMONSTRATE symbiotic relationship. **DEVELOP** a simple model to demonstrate your understanding.	https://itunes.apple.com/us/app/glogster/id907433564?mt=8			
		UNDERSTAND how organisms interact with each other and their environment.	www.slideshare.net/Kerriep7/types-of-interactions-35274008?related=1			
		DEMONSTRATE how organisms interact with their environment.	http://teacherstryscience.org/sites/default/files/uploads/lessonplan/resources/pill_but_lab_flipchart.			
Evidence of Common Ancestry and Diversity	In this lesson, you will explore fossils, the mineral replacements, preserved remains, or traces of organisms that lived in the past. 3.1.7.C3					
		IDENTIFY fossils and their attributes in your local region.	https://itunes.apple.com/us/app/the-fossilator/id495922566?mt=8			

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		LEARN about fossils and what they can tell us about earth's history.	https://www.khanacademy.org/partner-content/nova/evolutionlab/evolution-101/v/fossils-rocking-the-earth			
		LEARN about the qualities of fossils and how they are created over time.	http://www.mooremiddleschool.org/users/6MyDocs/Fossils.ppt			
		IDENTIFY different types of fossils.	http://mjksciteachingideas.com/pdf/BlogFossilLab.pdf			
Natural Selection	In this lesson, you will explore genetic variations among individuals in a population and how mutations give some individuals an advantage in surviving and reproducing in their environment. 3.1.7.C1	**SUMMARIZE the attributes of n**atural selection.	https://www.youtube.com/watch?v=0SCjhI86grU			
		LEARN how different species are similar and share common genes.	https://www.youtube.com/watch?v=IIEoO5KdPvg			
		LEARN the unique evolutionary history of the kangaroos.	https://pbslearningmedia.org/resource/nvaus.sci.bio.kangaroos/the-evolution-of-kangaroos/			
		DEMONSTRATE your knowledge of natural selection. CREATE a cartoon of an animal of your choice and an obstacle it overcame by evolving.	https://itunes.apple.com/us/app/nova-elements/id512772649?mt=8			
Adaptation	In this lesson, you will explore adaptation by natural selection and its role over generations - an important process by which species change over time in response to changes in environmental conditions. 3.1.7.B1	**LEARN** how species change in response to environmental conditions.	www.pbslearningmedia.org/resource/klvxnightlizard/night-lizards/			
		UNDERSTAND how adaptations are produced by natural selection.	http://www.biology4kids.com/files/studies_evolution.html			
		UNDERSTAND how adaptations are produced.	https://www.youtube.com/watch?v=-BzPjwL6JAs			
		DEMONSTRATE knowledge of animal adaptation. CREATE a cartoon of how an animal adapts to living in a particular environment.	https://itunes.apple.com/us/app/comic-maker-hd/id649271605?mt=8			

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Biodiversity and Humans	In this lesson, you will explore biodiversity - the wide range of existing life forms that have adapted to the variety of conditions on Earth, from terrestrial to marine ecosystems.	**LEARN** how recycling is an ecosystem service needed for human life.	https://www.youtube.com/watch?v=7nZXyjrBraY			
		CREATE a recycling sorting game that identifies the different materials that can be recycled.	https://itunes.apple.com/us/app/tinytap-make-play-educational/id493868874?mt=8			
		ASSESS your knowledge on natural selection.	www.jognog.com/PlayQuestions.aspx?levelpos=2&leveltotal=3&towerid=1679			