Introduction

	This Pennsylvania Learns iTunes U course is a collection of resources to support teaching and learning in the Grade 5 classroom. The content of this course is organized around the Grade 5 Pennsylvania Academic Standards for Science and Technology and Engineering. We believe that Pennsylvania teachers know what is needed to support their instructional design and delivery as well as what engages students in their own learning. For those reasons, the materials and resources provided in this course were curated by teachers. This course is not a curriculum. It is a collection of assets aligned to Pennsylvania Academic Standards to support teaching and learning. The topics found in this course do not need to be taught in order.

Module Title	Message	Assignment / Call to Action	Content Directions	Resource / URL	Info about the URL (published on the "i" button of a resource/ url)	Notes
Life Science	In this module, you will learn about the dependence of the sun to life on earth, how organisms change over their lifetime, and how they compare to other organisms. You will also learn that organisms are made up of cells and how, what, and why cells are needed. Lastly, you will look at genetics and how humans inherit and learn traits throughout our lives.					
Organisms and Cells: Energy Flow	In this lesson, you will look at how life on earth is dependent upon energy from the sun and how the processes of photosynthesis takes place. 3.1.5.A2.	LEARN about the sun's importance to the growth and development of earth.		http://www-spof.gsfc.nasa.gov/stargaze/Sun1lite.htm		
		LEARN about what the sun is and its role in life.		http://www.skwirk.com/p-c_s-4_u-199_t-557_c-2074/the-importance-of-the-sun/nsw/science/the-solar-system/the-sun-the-earth-and-the-moon		
		LEARN about how the sun effects plants through the process of photosynthesis.		https://www.youtube.com/watch?v=D1Ymc311XS8		
		REVIEW the process of photosynthesis and the variables which affect it.		https://s-media-cache-ak0.pinimg.com/736x/80/e7/8f/80e78f6b81b6ba782854e394aae64c64.jpg		
		EXPLORE the process of photosynthesis.	After you open the app., scroll until you find the "photosynthesis" section.	https://itunes.apple.com/us/app/virtual-cell-animations/id427893931?mt=8		
		EXPLORE the importance of the sun and the effect it has on the surrounding environment.	After you've created a world, adjust the amount of sunlight. Notice the effect it has on your environment.	https://itunes.apple.com/us/app/sandbox-build-create-your/id520777858?mt=8		
Organisms and Cells: Life Cycles	In this lesson, you will compare and contrast life cycles of different organisms to see how they are related and different. You will see the cycle of a butterfly, frog and other organisms. 3.1.5.A3.	ANALYZE the life cycle of the butterfly.		https://www.youtube.com/watch?v=7AUeM8MbaIk		
		INVESTIGATE the life cycle of a frog.		https://itunes.apple.com/us/app/life-cycle-of-the-frog/id827625635?mt=8		

		EXPLORE the life cycles of different insects.		https://itunes.apple.com/us/app/animals-life-cycle-insects/id658736303?mt=8		
		DISCOVER the unique life cycle of a bat.		http://www.kidzone.ws/images-changed/bats/batlifecycle.gif		
Organisms and Cells: Form and Function	In this lesson, you will immerse yourself into the world of the cell. You'll learn about both plant and animal cells and how they function within a system. 3.1.5.A5.	LEARN about how all life is made up of cells.		http://youtu.be/gFuEo2ccTPA		
		LEARN about the parts and functions of the plant and animal cells.		http://www.slideshare.net/ECSD/animal-and-plant-cells-9242755		
		INVESTIGATE what makes up animal cells.		https://itunes.apple.com/us/app/cell-world/id873302906?mt=8		
		REVIEW the parts and functions of the animal cells. CREATE a presentation using the attached document.		https://drive.google.com/file/d/0B99Um_mvTWdGNEd4Qy0yTGFKZkU/view?usp=sharing		
		REVIEW the parts and functions of the plant cells. CREATE a presentation using the attached document.	Open the PDF and choose to "Open In" the Explain Everything app.	https://drive.google.com/file/d/0B99Um_mvTWdGQVp1WGlodlJiMG8/view?usp=sharing		
Genetics : Heredity	In this lesson you will explore the concept of inherited traits, those that are given to the organism at birth; and acquired traits, or those traits that are picked up from the surrounding environment. 3.1.5.B1.	LEARN about inherited and acquired traits and examples of each.		https://www.youtube.com/watch?v=7ol6ravKe60		
		LEARN about inherited traits.		http://www.slideshare.net/pclarkocs/inherited-traits-31056636		
		DEMONSTRATE your knowledge of inherited and genetic traits. CREATE a presentation using pictures.	Find or take pictures to help model inherited and genetic traits.	https://itunes.apple.com/us/app/explain-everything-interactive/id431493086?mt=8		
		INVESTIGATE the many different genetic traits and the qualities associated.	This app goes deeper than what is needed for understanding, but allows you to interact to gain a better sense of heredity.	https://itunes.apple.com/us/app/gene-screen/id447754230?mt=8		

Evolution : Natural Selection and Adaptation	In this lesson, you will discuss adaptations and how organisms have changed to meet the needs of their environment. You will see examples of these changes and what causes these changes to occur. 3.1.5.C1., 3.1.5.C2.	LEARN about defense features organisms developed over time.		https://itunes.apple.com/us/book/adaptations/id642658736?mt=11		
		LEARN about natural selection and adaptation.		http://www.sciencechannel.com/tv-shows/greatest-discoveries/videos/100-greatest-discoveries-shorts-natural-selection/		
		INVESTIGATE the different types of adaptations.		http://education.nationalgeographic.com/encyclopedia/adaptation/		
		EXPLORE the many adaptations of organisms in your environment.	There are many animals to look at on this page. Select a few of your favorites and make a presentation about them.	https://faculty.washington.edu/chudler/amaze.html		

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Earth and Space Sciences	In this module, you will be looking into the science of earth and space. You will begin by looking at how the earth has changed over time and the causes of those changes.					
Earth Features and the Processes that Change It	In this lesson, you will see how the surface of the earth has changed over time by forces like erosion, weathering and sedimentation, as well as what causes these forces to take place. 3.3.5.A1.	LEARN about how the earth changes over time. From the video, TAKE a SCREENSHOT of an example of weathering.		http://www.nps.gov/featurecontent/brca/bryce_experience-uncaptioned.m4v		
		EXPLAIN how your screenshot from the previous activity demonstrates weathering. CONSTRUCT a presentation which models the concept using the screenshot.	Upload the screenshot to your favorite annotative app and explain.	https://itunes.apple.com/us/app/explain-everything-interactive/id431493086?mt=8		
		INVESTIGATE the destructive power of a volcano and SCREENSHOT an example.	Use the Air Pano Volcano 360 App to capture a screen shot of a volcanic eruption. Use the screen shot as a background for your Educreation video explanation of volcanic eruptions.	https://itunes.apple.com/us/app/volcano-360/id651461233?mt=8		
		LOCATE an example of a landform using the Google Earth app. CREATE a presentation using your example to share how the landform was shaped by different forces.	https://itunes.apple.com/us/app/google-earth/id293622097?mt=8	https://itunes.apple.com/us/app/explain-everything/id431493086?mt=8		
Earth's Resources/ Materials	In this lesson, you will investigate how we as humans have used earth's resources (both renewable and nonrenewable) as materials to help develop the human made world. You will see the effects of this usage and alternative ways in which we could go. 3.3.5.A2.	LEARN about earth's natural resources.		http://www.ecofriendlykids.co.uk/naturalresourcesearth.html		
		LEARN about how we use earth's natural resources.		http://www.geography4kids.com/files/land_natresource.html		

		LEARN about how we use earth's resources in our human made world.		https://www.youtube.com/watch?v=a_6M3CNZRkU		
		LEARN about renewable and nonrenewable energy.		https://www.youtube.com/watch?v=pBTnVoEIb98		
		EXPLORE how we use energy in our environment and its effects on earth's resources.		http://needtoknow.nas.edu/energy/energy-use/home-work/		
		CONSTRUCT your own virtual world using different earthen elements.		https://itunes.apple.com/us/app/sandbox-build-create-your/id520777858?mt=8		
Earth's History	In this lesson, you will learn how the process of tectonic plate movement has changed the face of the earth's surface over millions of years and how this process takes place. 3.3.5.A3.	LEARN how the plate tectonics move and shape the landscape.		https://www.youtube.com/watch?v=tcPghqnnTVk		VIDEO
		LEARN how scientists can observe the plates.		https://itunes.apple.com/us/course/plate-tectonics/id561085652?i=120479448&mt=2		COURSE
		LEARN about the different types of interactions of plate tectonics.		http://www.geography4kids.com/files/earth_tectonics.html		ARTICLE
		LEARN about attributes of plates.		http://www.cotf.edu/ete/modules/msese/earthsysFlr/plates1.html		ARTICLE
		EXPLORE more about earthquakes.		https://itunes.apple.com/us/app/wake-up!-earthquake-free/id603942465?mt=8	App is free; This app provides a warning in advance of the presence of a seismic movement that allows you to gain precious time to rescue you and your loved ones. Comes with a seismograph, audio, visual and flash led.	APP
		PRESENT the different ways the plates interact and their affect on the earth's surface CREATE collage using example images.		https://itunes.apple.com/us/app/pic-collage-photo-video-text/id448639966?mt=8		APP

Water	In this lesson, you will investigate the process of the water cycle; perception, run-off, evaporation, transpiration and condensation. You will also see how the process happens with the sun and temperature difference. 3.3.5.A4.	LEARN about the process of the water cycle.		http://www.slideshare.net/jwilliams25/water-cycle1-power-point		
		INTERACT with the water cycle and the variables which affect it.		https://itunes.apple.com/us/app/the-water-cycle/id483114651?mt=8		
		ANALYZE the different stages of the water cycle. LABEL the parts using the attached document.		https://drive.google.com/file/d/0B99Um_mvTWdGVHBwbFhjVWVrMVk/view?usp=sharing		
		INVESTIGATE the water cycle.	http://water.usgs.gov/edu/watercycle-kids-int.html			
Weather and Climate	In this lesson, you will see how water and heat can produce weather and how this weather affects the world around us. You will see the differences between weather and climate and how to measure both. 3.3.5.A5.	LEARN about how precipitation is formed.		https://www.youtube.com/watch?v=SesRroclFtc		
		LEARN about how the sun, water, and atmosphere affect the weather and climate.	Begin with slide 4.	http://www.slideshare.net/ang_ruiz/energy-from-the-sun		
		LEARN about seasons, weather and how it's measured.		https://itunes.apple.com/us/book/weather/id634516437?mt=11		
		DISCOVER climate and climate charge and how they affect us.		http://www.nasa.gov/audience/forstudents/5-8/features/nasa-knows/what-is-climate-change-58.html		
		INVESTIGATE the weather data in your area over a week.	Screenshot an image of the weather radar (or a different map) everyday. Explain in the next activity.	https://itunes.apple.com/us/app/weather-underground-forecasts/id486154808?mt=8		
		TELL about the weather data you collected from the previous activity. CREATE a presentation using your data.		https://itunes.apple.com/us/app/explain-everything-interactive/id431493086?mt=8		
Composition and Structure	In this lesson, you will explore earth's place in the solar system and how it is affected by this relationship. You will see what causes the earth to orbit the sun and revolve around it's axis and what these motions cause. 3.3.5.B1.	INTERACT with our solar system and earth's orbit.		https://itunes.apple.com/us/app/a-solar-system-journey/id444804070?mt=8		

		EXPLORE the orbit of earth and other attributes it has within our solar system.		http://www.planetsforkids.org/planet-earth.html		
		LEARN about the earth's orbit around the sun.		https://www.youtube.com/watch?v=l64YwNl1wr0		
		LEARN about the seasons and the sun's place in the water cycle.		https://www.youtube.com/watch?v=l64YwNl1wr0		
		EXPLORE the effect of orbits.		http://academo.org/demos/orbit-simulator/		

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Physical Sciences	In this module, you will be looking at both chemical and physical science, beginning with changes in the properties of matter and understanding changes in states and concluding with understanding the relationships of force and motion.					
Properties of Matter	In this lesson, you will investigate how water changes states of solid, liquid and gas as heat is added or taken away. You will look inside the structure of water and see how the molecules make these changes happen and how it relates to the world around us. 3.2.5.A1.	LEARN how water changes states as you add or take away heat.		https://www.youtube.com/watch?v=tuE1LePDZ4Y		
		EXPLORE further the changing states of matter with water.		https://www.youtube.com/watch?v=KCL8zqjXbME		
		INVESTIGATE the states of matter.		http://thebayarea.madscience.org/locations/thebayarea/images/StateOfMatterMSBayArea.jpg		
		LEARN about matter and its properties.		https://www.youtube.com/watch?v=kjnLQ1se2mg		
		LEARN about atoms and their composition.	only watch video 0:00-2:00	https://www.youtube.com/watch?v=_INF3_30lUE		
		LEARN about the properties of the three states of matter.		http://www.teachertube.com/video/states-of-matter-257987		
		LEARN about plasma which is known as the 4th state of matter.	watch video from 0:00-1:34	https://www.youtube.com/watch?v=VkeSI_B5Ljc		
		EXPLORE the property and qualities that make up the state of plasma.		http://www.spaceweathercenter.org/amazing_plasmas/02/02.html		
		DEMONSTRATE how water changes by taking away or increasing heat.	CONSTRUCT a presentation which models the concept.	https://itunes.apple.com/us/app/explain-everything-interactive/id431493086?mt=8		

Force & Motion of Particles and Rigid Bodies	In this lesson, you will look at force and motion and how motion can be affected by a change in mass or outside force. Looking into Newton's Three Laws of Motion will help to provide insight to understand why these changes in motion take place. 3.2.5.B1.	LEARN about inertia and Newton's First Law of Motion.	READ Chapter 2 of Newton's Laws of Motion iBook.	https://itunes.apple.com/us/book/newtons-laws-of-motion/id574566175?mt=11		
		EXPLORE Newton's Laws and examples of real world applications.		http://www.slideshare.net/koniasunset/newtons-3-laws-of-motion-14466651		
		LEARN about Newton's Second Law.	READ Chapter 3 Newton's Laws of Motion iBook.	https://itunes.apple.com/us/book/newtons-laws-of-motion/id574566175?mt=11		
		LEARN about acceleration and Newton's Second Law of Motion.		http://www.slideshare.net/marystar3/2nd-law-of-motion-38954538		
		DEMONSTRATE Newton's Laws and the factors which effect them.		https://itunes.apple.com/us/app/rube-works-official-rube-goldberg/id716238013?mt=8		
		LEARN about Newton's Third Law of Motion.	READ Chapter 4 of Newton's Laws of Motion iBook.	https://itunes.apple.com/us/book/newtons-laws-of-motion/id574566175?mt=11		
		INVESTIGATE forces, motion, friction, and acceleration.		https://phet.colorado.edu/sims/html/forces-and-motion-basics/latest/forces-and-motion-basics_en.html		
		LEARN about action and reaction forces.		https://itunes.apple.com/us/book/newtons-laws-of-motion/id574566175?mt=11		
Energy Storage and Transformations	In this lesson, you will look at how energy can be transferred from one form to another and how heat can transfer through radiation, convection and conduction. You will see how energy transfer can cause the release of heat and how this byproduct has become a source of energy in our human made world. 3.2.5.B2., 3.2.5.B3.	INVESTIGATE how energy is transferred from one form to another.		http://www.slideshare.net/jbishopgcms/energy-transformations-and-conservation		
		LEARN about the process of energy being transferred.		https://www.youtube.com/watch?v=Atnjo7dD_bA		
		EXPLORE the different ways we use heat energy.	As you look at the examples, think about how that heat energy is produced.	http://examples.yourdictionary.com/examples-of-heat-energy.html		
		LEARN about how energy is produced through heat.	Read only the first two pages on the topic of heat.	http://www.uen.org/core/science/sciber/TRB6/downloads/06literacy.pdf		

		LEARN how energy transformation produces heat.	Make sure to watch the Bill Nye video that goes along with it.	http://scienceforkids.kidipede.com/chemistry/atoms/heat.htm		
Electrical and Magnetic Energy	In this lesson, you will look at the workings of an electrical circuit and how electrical energy is transferring. You will see the different kinds of simple circuits and their application. You will also look into what electromagnets are and how they are created. 3.2.5.B4.	LEARN about electromagnets.		http://thekidshouldseethis.com/post/80799274938		
		LEARN how magnets can produce electricity and how it is used.		http://www.explainthatstuff.com/magnetism.html		
		EXPLORE electromagnets and how they work.	Complete the activity with the guidance of an adult.	http://scienceforkids.kidipede.com/physics/electricity/doing/electromagnet.htm		
		EXPLORE how circuits and electricity work.		https://itunes.apple.com/us/app/everycircuit/id797157761		
		INVESTIGATE the properties and attributes of electricity.		https://itunes.apple.com/us/app/electricity-by-kids-discover/id871350979		
		EXPLORE simple circuits.		https://itunes.apple.com/us/app/exploriments-electricity-simple/id490164401?mt=8		
Nature of Waves (Sound and Light Energy)	In this lesson, you are discovering the characteristics of sound waves and how they are effected by different types of materials. You will focus on the rate of vibration and pitch difference in these sound waves. 3.2.5.B5.	LEARN what sound is and about its attributes.		http://www.ducksters.com/science/sound101.php		
		EXPLORE the properties that make up sound waves.	Complete this investigation (with a parent).	http://www.ducksters.com/science/experiment_sound_pitch.php		
		EXPLORE the science of sound vibrations.	Complete this activity (with a parent).	http://www.ducksters.com/science/experiment_sound_vibrations_kazoo.php		
		LEARN how sound waves behave when they interact with another object.		http://www.ducksters.com/science/physics/wave_behavior.php		

		INTERACT with different variables to EXPLORE the effects of waves.	As you explore make sure to note what is happening to the wave as you modify it.	http://www.physicsclassroom.com/Physics-Interactives/Waves-and-Sound/Simple-Wave-Simulator/Simple-Wave-Simulator-Interactive		
		INTERACT with waves and the variables which affect them.		https://phet.colorado.edu/sims/html/wave-on-a-string/latest/wave-on-a-string_en.html		