This Pennsylvania Learns iTunes U course is designed to be a collection of resources to support teaching and learning in the Second Grade classroom. The content of this course is organized around the Second Grade Pennsylvania Academic Standards for Science and Technology and Engineering Education. 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 K – 2 courses are designed to support teaching and learning…the teaching of the teacher and the learning of the student. The TEACHING Call to Action statements support the teacher's instruction. The I CAN Call to Action statements are for students and correspond to the instructional skills taught by the teacher.

Title/Topic	Message	Assignment / Call to Action (200 Character Max)	Resource / URL	Info about the URL (published on the "i" button of a resource/ url)	Notes
Science As Inquiry	In this lesson, students develop an understanding that science content is enhanced when concepts are grounded in inquiry experiences. The use of scientific inquiry helps ensure a deep understanding of science content, processes, knowledge and understanding of scientific ideas, and the work of scientists; therefore, inquiry is embedded as a strand throughout all content areas and not a standalone. Teaching science as inquiry provides teachers with the opportunity to help all students in grades K-12 develop abilities necessary to understand and do scientific inquiry. These are very similar across grade bands and evolve in complexity as the grade level increases. 3.1.2.A9, 3.1.2B6, 3.1.2C4, 3.2.2.A6, 3.2.2B7, 3.3.2.A7, 3.3.2.B3	TEACHING about observation, investigation, technology and other tools (levers).	https://youtu.be/iqrx3_wZf08	WATCH the video Scientific Observation for 2nd Grade.	Requires reading, the teacher can read the speech bubbles to the students.
		TEACHING the scientific method.	https://youtu.be/bUa-ilQqEv0	LISTEN to The Scientific Method Rap.	VIDEO FUN
		TEACHING scientific inquiry and using the scientific method.	https://archive.org/details/NasaSciFiles-TheScientificMethod	WATCH the video about using the scientific method.	VIDEO ARTICLE
		TEACHING the scientific method.	https://itunes.apple.com/us/album/scientific-method-song/id423354230?i=423354512	LISTEN to a song about the scientific method.	SONG: 99 cents on iTunes.
		I CAN use the scientific method.	https://itunes.apple.com/us/app/bill-nye-the-science-guy/id652548755?mt=8	PERFORM Do-It-Yourself Experiments included in this free app.	APP
		I CAN put the scientific method in the correct order and DISCUSS the importance of communication.	TINY TAP- http://appsto.re/us/kD9BD.i	ORDER the steps of the Scientific Method and DISCUSS reasoning for communication	In Tiny Tap-Search Scientific Method- Click Game 4
		I CAN learn to use the scientific method and follow each step to create a science fair project.	http://www.sciencebuddies.org/	Hands on science resources for home and school	EXPERIMENTS

Using Data and Evidence	In this lesson, students learn to use data/evidence to construct explanations and understand that scientists develop explanations based on their evidence and compare them with their current scientific knowledge. 3.1.2.A9, 3.1.2B6, 3.1.2C4, 3.2.2.A6, 3.2.2B7, 3.3.2.A7, 3.3.2.B3	TEACHING how scientists develop explanations based upon data.	https://itunes.apple.com/us/app/biokids/id509242921?mt=8	This is a free resource that may reach above grade level.	App: BioKIDS
		TEACHING how scientists observe to gather evidence.	https://www.calacademy.org/educators/lesson-plans/observe-like-a-scientist		
		I CAN use data to gather evidence and develop explanations based on evidence.	https://itunes.apple.com/us/app/biokids/id509242921?mt=8	This is a free resource that may reach above grade level.	App: BioKIDS
		I CAN observe and gather evidence.	https://itunes.apple.com/us/app/super-notes-recorder-note/id484001731?mt=8	Voice record or write notes.	
		I CAN ask good scientific questions.	http://www.sciencebuddies.org/science-fair-projects/ask_an_expert_intro.shtml	*ASK an expert questions	INTERACTIVE
			http://www.sciencebob.com/experiments/index.php	*USE the "Make it an Experiment" to learn about good scientific questions	EXPERIMENTS

Title/Topic	Message	Assignment / Call to Action (200 Character Max)	Resource / URL	Info about the URL (published on the "i" button of a resource/url)	Notes
Module 1: Earth and Space Sciences	Module 1 engages students in the discovery of our place in space and how it effects things such as night and day, seasons, patterns in the moon as well as causes changes in water. Students learn the water cycle as it occurs naturally in earth's water landforms.				
Earth Structure, Processes and Cycles	In this lesson, students learn about the water cycle and water landforms and changes they undergo. Students engage in: the exploration of water in both solid and liquid form; describing different forms of water; and illustrating evaporation and condensation. 3.3.2.A4				
		TEACHING different water landforms exist (i.e. river, lake, ocean)	https://www.brainpop.com/science/earthsystem/oceans/	WATCH the video to learn about oceans.	
		I CAN sort and identify water landforms.	https://www.superteacherworksheets.com/landforms/bodies-of-water-cards_WMWNT.pdf	IDENTIFY water landforms.	
		TEACHING that water exists in different forms (solid, liquid, and gas).	https://youtu.be/T-QimFDbgi4		
		TEACHING about glaciers.	http://study.com/academy/lesson/what-are-glaciers-types-facts-pictures.html	Watch the video about glaciers.	
		TEACHING how liquid water forms ice.	http://www.drinktap.org/kids/water-science-projects.aspx	PERFORM the experiment to see how liquid waters becomes ice.	
		TEACHING how glaciers are formed.	https://www.teachervision.com/science/lesson-plan/3834.html		
		I CAN identify and define river, lake, ocean, and glaciers.	https://itunes.apple.com/us/app/popplet-lite/id364738549?mt=8	CREATE a popplet showing water exisiting as a solid and liquid in our world.	
		TEACHING the water cycle	https://jr.brainpop.com/science/weather/watercycle/	WATCH this video about the water cycle.	

Title/Topic	Message	Assignment / Call to Action (200 Character Max)	Resource / URL	Info about the URL (published on the "i" button of a resource/url)	Notes
		I CAN understand the water cycle.	https://www.youtube.com/watch?v=i3NeMVBcXXU	LISTEN to the water cycle rap.	
		I CAN identify the different steps of the water cycle.	https://itunes.apple.com/us/app/the-water-cycle/id483114651?mt=8	LABEL the steps of the water cycle.	
		I CAN perform the experiment to simulate the water cycle.	http://mjksciteachingideas.com/pdf/WaterCycleSim.pdf	PERFORM the experiment too see the water cycle in action.	???
Origin and Evolution of the Universe	In this lesson, students differentiate between revolve and rotate as it relates to objects in our solar system, phases of the moon, and sunrise and sunset based observed patterns. Students engage in observing and recording the location of the Sun and Moon at different phases; changes in the appearance of the Moon over time; and predicting seasonal patterns of sunrise and sunset. 3.3.2.B1				
		TEACHING our solar system (planets, moons, etc.) orbits the sun.	https://jr.brainpop.com/science/space/sun/	WATCH the video to learn about the sun.	
		TEACHING the difference between revolve and rotate.	http://www.msnucleus.org/membership/html/k-6/uc/solar_system/k/ucssk_2a.html	LEARN how planets rotate and revolve around the sun.	
		TEACHING the difference between revolve and rotate.	https://www.youtube.com/watch?v=88ZfRsgBaC0	LISTEN and WATCH the rotate and revolve song.	
		I CAN demonstrate rotation and revolution.			
		I CAN describe how the moon orbits the Earth and the phases of the Moon.	https://www.youtube.com/watch?v=AQ5vty8f9Xc	WATCH the video to learn about the moon	
		I CAN explain how seasons happen because of the tilt of the earth and position in its orbit.	https://www.youtube.com/watch?v=D6yQ8-M8rmU	WATCH the video to learn about the seasons	
		I CAN observe, describe and predict patterns of sunrise and and sunset.	https://itunes.apple.com/us/app/day-and-night-world-map/id413493783?mt=8	ANALYZE look different at different times using the free app 'Day and Night Map'	

Topic/Title	Message	Assignment / Call to Action (200 Character Max)	Resource / URL	Info about the URL (published on the "i" button of a resource/ url)	Notes
Module 2: Physical Science	Module 2 provides the opportunity for students to explore the chemical and physical properties of matter and discover matter has 3 states, states can change, some changes of matter are caused by chemical reactions where other changes are physical changes.				
Chemistry	In this lesson, students investigate changes in the properties of matter, identifying the phases and changes made, and how heating and cooling may cause changes in the properties of materials.	I CAN understand matter by watching the video.	https://www.youtube.com/watch?v=tuE1LePDZ4Y		
		TEACHING about changing states of matter	http://www.brainpop.com/educators/community/lesson-plan/changing-states-of-matter-activities-for-kids/		
		I CAN explain how heat makes matter change phase	You tube kids app (replace video above) https://appsto.re/us/U1q23.i	In app, search phases of matter + Make me genius	
		I CAN make a liquid change into a solid	http://www.teachnet.com/lesson/science/icecream051999.html	Making Ice cream lab	
		I CAN play Phase change rummy to identify phase changes	http://www4.esc13.net/uploads/science/docs/manipulatives/phasechangecardgameelem.pdf		
		CREATE a review game about the phases of matter and phase changes	https://itunes.apple.com/us/app/tinytap-make-play-educational/id493868874?mt=8	Tiny Tap-Free iPad app	
Reactions	In this lesson, students learn about mixing substances and learn about dissolving and sorting materials that will and will not dissolve. 3.2.2.A4	TEACHING about mixtures and dissolving.	https://www.youtube.com/watch?v=r0nNvsB_fOw&app=desktop		

		TEACHING about mixtures and solutions as you complete the experiment.	http://www.brighthubeducation.com/lesson-plans-grades-3-5/53109-mixtures-and-solutions-chemistry-lesson/		
		TEACHING about mixtures and properties of matter in this lesson.	http://web.missouri.edu/~hanuscind/4280/Exploring%20Mixtures%20-%20Grade%202.pdf		
Unifying Themes	In this lesson, students investigate and identify the 3 states of matter and learn that everything is made of matter. 3.2.2.A5	TEACHING about the three states of matter	http://www.brighthubeducation.com/lesson-plans-grades-1-2/39470-moving-molecules-lesson-on-the-three-states-of-matter/		
		I CAN see that everything is made of matter.	https://www.youtube.com/watch?v=ELchwUIlWa8&feature=youtu.be		
		I CAN show my understanding of the types of matter in this activity.	https://cdn-jr.brainpop.com/science/matter/solidsliquidsandgases/activity/	Link to printable worksheet	
		I CAN review vocabulary for the states of matter.	https://quizlet.com/14695296/properties-of-matter-2nd-grade-flash-cards/		
Physics Energy Storage and Transformations: Conservation Laws	In this lesson, students discover how matter changes and learn about chemical and physical changes as well as how different forms of energy cause changes. (e.g., sunlight, heat, wind) 3.2.2.B2	TEACHING about physical and chemical changes	http://www.brainpop.com/educators/community/lesson-plan/physical-and-chemical-changes-background-information/?bp-jr-topic=physical-and-chemical-changes		
		I CAN understand how matter changes by watching the video.	https://www.youtube.com/watch?v=Fj1IdOdmOjY	Changes: A Science Rap	

Topic/Title	Message	Assignment / Call to Action (200 Character Max)	Resource / URL	Info about the URL (published on the "i" button of a resource/url)	Notes
Module 3: Life Sciences	Module 3 engages students in the exploration of plants and animals. Students learn plant and animal life cycles, the parts of a plant and how each part plays a role in the plants survival. In addition, students learn about dinosaurs, how they became extinct, and how they compare to modern day animals.				
Evolution	In this lesson, students learn about animals that once lived on Earth, are extinct; yet, there are living things that resemble these extinct animals in some way. Students will engage in the exploration of dinosaurs and compare these extinct creatures with animals living on earth today. In addition, students will understand why dinosaurs no long live on earth. 3.1.2.C3	TEACHING why dinosaurs no longer exist.	http://www.timeforkids.com/news/what-killed-dinosaurs/167841	READ the article to learn about an extinction theory.	
		TEACHING how dinosaurs are similar to animals that exist today.	http://www.enchantedlearning.com/subjects/dinosaurs/dinoclassification/	Students analyze the chart and diagram.	
		I CAN analyze the chart and diagram to see how dinosaurs resemble animals of today.	https://itunes.apple.com/us/app/picturebook/id429810668?mt=8	Students write a story to synthesize all learning about the constancy and change of dinosaurs' characteristics.	
		I CAN explain why dinosaurs are no longer on the Earth.	https://itunes.apple.com/us/app/picturebook/id429810668?mt=8	Students write a story to synthesize all learning about the constancy and change of dinosaurs' characteristics.	
Adaptation	In this lesson, students learn that living things can only survive if their needs are being met. 3.1.2.C2.	TEACHING about what plants need to survive.	https://www.youtube.com/watch?v=dUBIQ1fTRzI	Song about what plants need to survive	

		I CAN explain what plants need to survive.	https://itunes.apple.com/us/app/animoto-video-maker/id459248037?mt=8	Students use the iPad camera to take daily pictures of the biome; photos can then be analyzed in a movie made with Animoto to show a time lapse video of the biome growing.	
		TEACHING what animals need to survive.	https://www.youtube.com/watch?v=k4UDf3tF_O4	Song about what animals need to survive	
		I CAN explain how animals survive.	https://itunes.apple.com/us/app/popplet-lite/id364738549?mt=8	Use Popplet to make a graphic organizer of one animal and its four basic needs to synthesize their learning.	
Life Cycles	In this lesson, students learn about plant and animal life cycles. 3.1.2.A3	TEACHING life cycles.	https://www.youtube.com/watch?v=-pHav-3QZkI	This video introduces the idea of a life cycles with a connection to how all living things grow.	
		TEACHING life cycles of the butterfly.	https://www.youtube.com/watch?v=MQXPQRaaolM	Video details life cycle of a butterfly.	
		I CAN with a partner explain the life cycle of the butterfly.	https://itunes.apple.com/us/app/educreations-interactive-whiteboard/id478617061?mt=8	Use APP to draw and narrate the life cycle of an animal.	
FIND PDF TO GO WITH THIS		I CAN explain the life cycle of a frog.	https://youtu.be/AMrkcQ4eX_A	Learn all about the life of frogs with Franklin and his family!	
		I CAN can explain the life cycle of a frog through drawing.	https://itunes.apple.com/us/app/glow-draw!/id364873934?mt=8		

		I CAN identify the stages of an animal life cycle.	https://itunes.apple.com/us/app/animals-life-cycle-insects/id658736303?mt=8	USE APP to place insects in the correct life cycle order.	
		TEACHING about plant life cycles.	http://www.jumpstart.com/common/life-cycle-of-a-plant-view	This free website offers introduction to plant life cycles and importance of plants for animals.	
		I CAN learn about the plant life cycle by watching this video.	~~https://appsto.re/us/U1q23.i~~	Video introduces the stages of a plant life cycle.	
		I CAN identify the stages of a plant cycle.	https://itunes.apple.com/us/app/seed-cycle/id440030386?mt=8	APP cost 99 cents. This APP allows children to grow a plant and complete plant life cycle stages. Includes read to me option	
		I CAN record the stages of a plant life cycles.	http://files.havefunteaching.com/free-worksheets/science/plant-life-cycle-worksheet.pdf	Students plant a seed in a clear cup then observe the growth through observation. Students then use this worksheet to document the changes they have seen.	
		I CAN compare and contrast the life cycle of a plant and animal.	https://itunes.apple.com/us/app/color-pencils-drawing-painting/id959403927?mt=8	Drawing app for students to compare and contrast plant and animal life cycles.	
Forms and Function	In this lesson, students learn how different parts of a plant work together to make the organism function. Students engage in labeling parts of a plant and identifying the function of the various parts of a plant. 3.1.2.A5	TEACHING the parts of a plant and their functions.	https://www.youtube.com/watch?v=X6TLFZUC9gI	Video shows and explains each part of a plant.	

		I CAN label the parts of a plant.	https://itunes.apple.com/us/app/tinytap-make-play-educational/id493868874?mt=8	Free app reviews plants/ foods kids know and then has them label the parts of a plant. There are other plant games already saved for use.	
		I CAN explain the parts of a growing plant.	https://itunes.apple.com/us/app/flip-it!-lite/id312729700?mt=8	Students create a book to show the parts of a plant and their functions.	
		TEACHING about the functions of each plant part by watching this video.	https://www.youtube.com/watch?t=57&v=CX2m2n2uDAE	Video shows and narrates each part of plant and their function.	
			http://www.ehow.com/info_8127556_functions-plant-parts-kids.html		
			http://www.doe.virginia.gov/testing/sol/standards_docs/science/2010/lesson_plans/grade1/life_processes/sess_1-4b.pdf	A printable lesson and hands on activity to manipulate the parts and functions of plants.	
		I CAN explain the functions of plant parts.	https://itunes.apple.com/us/app/imovie/id377298193?mt=8	Students take pictures of plant parts then create a narrated movie with the functions of each part.	