

## CURRICULUM GUIDE

GRADE: 7<sup>th</sup>/8<sup>th</sup> Grade

SUBJECT: STEM

TIMELINE: 1<sup>st</sup> Quarter

Standard	Kid Friendly Learning Objectives	Content (subject or topic covered in zSpace)	DOK Level	Skills (ability, practice, aptitude that will be learned)	Assessment	Academic Vocabulary
Introduction to TMS STEM	I will learn the academic and safety expectations of a STEM classroom.	Introductions, Classroom Expectation, Classroom Contract, Syllabus, Hand book, Composition Book	1	Introductions/ Classroom Expectation, Classroom Contract, Syllabus, Hand book, Composition Book	Students will carry out a hazard and risk assessment for the classroom.	Expectations Hazard Safety
Introduction to zSpace Studio, Newton's Park, Franklin's Lab	I will manipulate zSpace Studio, Newton's Park, Franklin's Lab using 3-D glasses and stylus.	Students will watch How to: zSpace Studio (4:03) zSpace Studio 2 (2:45) zSpace Studio 3 (2:42)	1	zSpace Studio Quick Start Guide: manipulate an object 180°, increase and decrease the size of an object	Welcome to zSpace zSpace Demo – Scavenger Hunt	Simulator
6.P1U1.1 - <b>Analyze and interpret data</b> to show that changes in states of matter are caused by different rates of movement of atoms in solids, liquids, and gases (Kinetic Theory).	The SWBAT show that changes in states of matter are caused by different rates of movement of atoms.	zSpace Studio: "Solid, Liquid or Gas"	2	Display on board – answer questions 1-3 as a whole group to model how to take photo, use zSpace to answer the questions.	Physical Science Pre-Assessment  Solid, Liquid or Gas Question Text Worksheet	Gas Liquid Mass Matter Molecule Solid
	The SWBAT to categorize objects into three states of matter.	<a href="https://youtu.be/ELchwUIlWa8">https://youtu.be/ELchwUIlWa8</a>	1	Use the classroom environment to look for different forms of matter.	Hunting For Matter Log	Categorize
	The SWBAT categorize solid, liquid, gas observable traits in a triple Venn Diagram.	Compare the observable traits of solids, liquids, and gases by writing and illustrating in the diagram.	2	Display on board – 16 statements – students will use the provided statements to complete the Venn Diagram.	Observable Traits Venn Diagram	Observable traits diagram

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	The SWBAT gather additional background information on “States of Matter”	Review States of Matter Identify the vocabulary terms (highlight terms and definitions) Students will use appropriate terms to answer the questions	1	Students will give correct definition for images of changes in state of matter; draw behavior of particles; categorize objects in state of matter; use graph on temperature changes to answer questions	States Of Matter Packet	
6.P1U1.2 - <b>Plan and carry out an investigation</b> to demonstrate that variations in temperature and/or pressure affect changes in state of matter.	The SWBAT demonstrate that variations in temperature / pressure affect changes in state of matter.	zSpace Studio: “Energy’s Effects on States of Matter”	2	Display on board – answer questions 1-3 as a whole group to model how to take photo, use zSpace to answer the questions.	Energy’s Effects on States of Matter Question Text Worksheet	Boiling point Condensation Evaporation Freezing Point Kinetic Energy Melting Point Thermal Energy
6.P1U1.3 <b>Develop and use models</b> to represent that matter is made up of smaller particles called atoms.	The SWBAT develop a model to represent that matter is made up of smaller particles called atoms.	Using Google Slides or Google Drawing to create a digital model of a phase diagram.	2	Students will create a digital model of a phase diagram of water involving both temperature and pressure.	A digital model of a phase diagram – Google Slides or Google Drawing	Digital Model
	The SWBAT gather additional background information on “States of Matter”	Students will use reading strategy RAPS to help answer questions in detail.	2	Review the chart on Properties of common states of matter. Focus on the “Fixed” or “Not Fixed” properties.	States of Matter Comprehension Questions	Fixed Not Fixed
6.P1U1.4 <b>Develop and use a model</b> to predict how forces act on objects at a distance.	The SWBAT explore and compare the effects on Earth’s gravitational force in Newton’s Park.	zSpace Newton’s Park: “Gravitational Force”	2	Display on board – answer questions 1-4 as a whole group to model how to take photo, use zSpace to answer the questions.	Gravitational Force Question Text Worksheet	Acceleration Gravitational Force Mass

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	The SWBAT record observations on gravity observations on different planets.	Gravitational Force Evidence: students record observations of gravity on other planets	2	Model how to search for gravity on Jupiter and compare it to Earth. Record observations.	Gravitational Force Evidence Log	Evidence Gravitational Force Gravity
	The SWBAT gather new information using visual presentations about tides.	<a href="https://youtu.be/KIWpFLfLFBf">https://youtu.be/KIWpFLfLFBf</a>	1	Students will take notes on the moons gravitational pull and its effects on tides.	Video Notes Sheet	Tides
	The SWBAT explore some effects that gravity has on our world and universe.	Review questions. Explain how to use cite textual evidence to answer the questions.	1	Students will answer 6 questions on the effects of gravity using reading comprehensions as a guide.	Effects of Gravity – Stations Worksheet	Effects
6.P4U2.5 <b>Analyze</b> how humans use technology to store (potential) and/or use (kinetic) energy.	The SWBAT predict the speed of a bowling ball and make connections between the ball's speed and its kinetic energy.	zSpace Newton's Park: "Kinetic Energy Transfer"	2	Display on board – answer questions 1-4 as a whole group to model how to take photo, use zSpace to answer the questions.	Kinetic Energy Transfer Question Text Worksheet	Collision Energy transfer Kinetic energy Law of conservation of energy Newtons Speed
	The SWBAT read "Introduction to Mechanical Energy" to gather background information on Kinetic and Potential Energy.	Students will create and glue/tape foldable in their notebook. They will provide examples of Kinetic and Potential Energy.	.1	Students will paste/tape the correct descriptions and picture cut-outs with the appropriate category and provide their own examples. They will describe a time when they have personally experienced kinetic or potential energy in their daily life	Interactive Notebook Foldable	Mechanical Energy
	The SWBAT identify the different types of potential and kinetic energy.	Mini Lab Stations - Kinetic Energy: Electrical Mini Station - Kinetic Energy:	3	Students will conduct a short experiment to demonstrate kinetic energy. They will identify the potential energy in their models.	Mini Station logs/record/observation sheet	

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		Mechanical Mini Station - Kinetic Energy: Thermal Mini Station		Rotate to another mini station.		
	The SWBAT explore the relationship among potential energy, kinetic energy, and friction.	zSpace Newton’s Park: “Conservation of Energy”	2	Display on board – answer questions 1-4 as a whole group to model how to take photo, use zSpace to answer the questions.	Conservation of Energy Question Text Worksheet	Friction Kinetic Energy Potential Energy Law of Conservation of energy
	The SWBAT create a model of potential energy, kinetic energy, conservation of energy of a bowling ball pendulum.	<a href="https://www.youtube.com/watch?v=xXXF2C-vrQE">https://www.youtube.com/watch?v=xXXF2C-vrQE</a>	2	Students will watch the bowling ball pendulum. They will create a diagram of the types of energy that was observed during the video.	Google Drawing or Google Slides or Google Docs	Pendulum
	The SWBAT determine how habitats are affected by the Sun.	zSpace Studio: “Fun with the Sun”	2	Display on board – answer questions 1-4 as a whole group to model how to take photo, use zSpace to answer the questions.	Fun with the Sun Question Text Worksheet	Earth Habitat Orbit Rotate Star Sun
	The SWBAT make observations about kinetic energy and its conversion to potential energy.	zSpace Newton’s Park: “Energy Skee Ball”	2	Display on board – answer questions 1-6 as a whole group to model how to take photo, use zSpace to answer the questions.	Energy Skee Ball Question Text Worksheet Energy Skee Ball Worksheet	Conservation of energy Conversion of energy Kinetic Energy Potential energy
	The SWBAT develop a model to show how humans use technology to store potential and/or use kinetic energy.	Project: Force, Mass, and Acceleration	3	Students will make a “sling shot” using a rubber band, two nails, and a board. They will experiment force, mass, and acceleration.	Experiment logs Sketch of designs Photos Procedure steps Materials	

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					Conclusion All will be typed and organized in Google Docs or Slides	
	The SWBAT develop a model to show how humans use technology to store potential and/or use kinetic energy.	Project: Make an Electromagnet	3	Students will make an electromagnet using a battery, copper wire, and iron nail.	Experiment logs Sketch of designs Photos Procedure steps Materials Conclusion  All will be typed and organized in Google Docs or Slides	Store Electromagnet
	The SWBAT engineering processes to design, build, and test a skee ball game.	Project: <a href="https://youtu.be/U2mgRPg_nl0">https://youtu.be/U2mgRPg_nl0</a>	3	Students will design, build, and test a skee ball game. They will design ideas through research and read about materials to use: card board, Styrofoam.	Data log (measurements: mass, length)  Pictures/Photos Drawn Diagrams	Mass Length
	The SWBAT use engineering processes to design, build, and test a working solar cooker.	Project: <a href="https://www.youtube.com/watch?v=qofh1vy2XzI">https://www.youtube.com/watch?v=qofh1vy2XzI</a>  <a href="https://youtu.be/NVthiVIIQps">https://youtu.be/NVthiVIIQps</a>	3	Students will design, build, and test a solar cooker. They will find design ideas through research. They will read about the materials required to use: insulation and black construction paper.	Data log (measurements: temp and time)  Pictures/Photos Drawn Diagrams	Temperature time

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<p>6.E1U1.6 <b>Investigate and construct an explanation</b> demonstrating that radiation from the Sun provides energy and is absorbed to warm the Earth’s surface and atmosphere.</p>	<p>The SWBAT understand why protecting the ozone layer is essential to maintaining life on Earth.</p>	<p>zSpace Studio: “Earth’s Ozone Layer”</p>	<p>2</p>	<p>Display on board – answer questions 1-6 as a whole group to model how to take photo, use zSpace to answer the questions.</p>	<p>Earth’s Ozone Layer Question Text Worksheet</p>	<p>Atmosphere Atom Depletion Molecule Oxygen Ozone Ozone layer Phytoplankton Radiation Stratosphere</p>
	<p>The SWBAT to read informational text to acquire background information on “Layers of the Atmosphere”.</p>	<p>Students will find distance of the layers of the atmosphere and describe the Earth’s atmosphere using reading from the passage.</p>	<p>1</p>	<p>Information will be glued into the notebooks.</p>	<p>Layers of the Atmosphere Interactive Notebook Notes</p>	<p>distance</p>
	<p>The SWBAT research the ozone layer and organize information in a presentation explaining findings.</p>	<ul style="list-style-type: none"> <li>▪ What is the chemical composition of ozone and the reasons why the oxygen molecule (O<sub>3</sub>)?</li> <li>▪ What pollutants cause ozone depletion?</li> <li>▪ What are the short-term and long-term effects of ozone depletion?</li> <li>▪ How can we reduce ozone depletion? What are other possible solutions?</li> </ul>	<p>2</p>	<p>Students will develop research questions to narrow their search on ozone layer. They will complete a Google Slides with their final research information.</p>	<p>Notes written in simple/own statements</p>	
	<p>The SWBAT use a model to describe how each layer of the atmosphere</p>	<p>Display on board – answer questions 1-6 as a whole group to model</p>	<p>2</p>	<p>zSpace Studio: “Layers of the Earth’s Atmosphere”</p>	<p>Layers of the Earth’s Atmosphere Question Text Worksheet</p>	<p>Altitude Atmosphere Biosphere</p>

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	protects the Earth.	how to take photo, use zSpace to answer the questions.			Exit Ticket: What are some things that you learned about the Earth's atmosphere?	Density Exosphere Geosphere Hydrosphere Mesosphere Meteorite Ozone layer Satellite Stratosphere Thermosphere Troposphere
	The SWBAT explain what makes Earth so special that it is the only planet in our solar system containing living organisms?	If you had to live on another planet, how would you survive?  What makes Earth so special that it is the only planet	2	Students will develop research questions to narrow their search on what is necessary to survive on a planet.  They will complete a Google Slides with their final research information.	Notes written in simple/own statements	Living organisms
	The SWBAT make a graph to represent the atmosphere layers based on temperature changes at different heights.	Graph the data sheet on the graph paper. Write a statement about what is noticed and draw a line where there is a change in temperature trend.	.1	Students will plot data points and analyze changes in data. They will identify the layers of the atmosphere based on the temperature changes	Layers of the Atmosphere graph, questions	Temperature trend
	The SWBAT conduct an investigation to determine why the temperature is different on Earth than space.	Why might the temperature on the Earth be different than the temperature in space?	2	Students will use the scientific method to investigate the differences in temperature.  Fill beaker ½ way with water and measure temperature. Record measurements.  Wrap test tube in foil and fill ½ way with water. Add	Data table  Notes of Scientific method:  Conclusion:  The goal of this experiment was _____.	Scientific method

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				thermometer to test tube and record temperature. Record measurements.  Add ice to the beaker and place test tube into beaker. Record temp of BOTH temperatures every 1 min on data table.	My hypothesis stated that _____. Based on my data table, my hypothesis _____. For example, _____. Once thing I could have done better or differently is _____.	