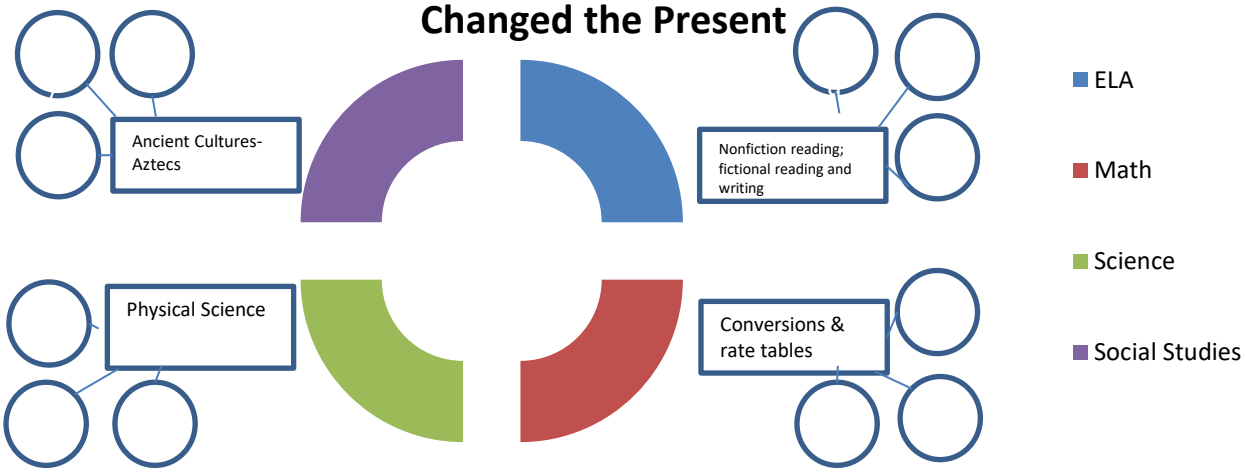
6th Grade STEM Unit #3: Making a Difference- How the Past Changed the Present



Grade Level	6	Unit Length	9 weeks
Unit Overview	***Making a Difference- How the Past Changed the Present***		
Unit Essential Question(s)	How did innovations and inventions of the past make a difference in their world? How do innovations and inventions of the past make a difference in our world today? How can our inventions and innovations today make a difference in the future?		
Culminating Events	Roller Coaster Project Presentations		
Common Assessment			

	STEM Project Rubric		**Project Title:** **Student Name:** **Date:**
	Advanced	**Proficient**	**Needs Improvement**
Math Components Conversions	Student is able to accurately convert measurements 100% of the time.	Student is able to accurately convert measurements 80% of the time.	Student is able to accurately convert measurements less than 80% of the time.
Rate Tables	Student can correctly create a rate table for 100% of the situations.	Students can correctly create a rate table for 80% of the situations.	Student is able to correctly create a rate table less than 80% of the time.
Science Components: Physical Science	Student will create a catapult made with pencils, rubber bands and a plastic spoon. The student will fire The catapult hitting A target with 90% Accuracy.	Student will create a catapult made with pencils, rubber bands and a plastic spoon. The student will fire The catapult hitting A target with 80% Accuracy.	Student will create a catapult made with pencils, rubber bands and a plastic spoon.
Social Studies	Students complete	Students follow teacher	Students complete less than

	Component Aztec Temple of Blood	100% of the Aztec Temple of Blood and complete additional work in Khan Academy's "Intro to Computing" (coding) lessons.	directions to complete 100% of the Aztec Temple of Blood using Khan Academy and coding.	100% of the Aztec Temple of Blood project, even with teacher support, using Khan Academy and coding.
	ELA Component Roller Coaster Presentation	Nonverbal and verbal skills enhanced the presentation and were appropriate for a professional setting. Information was organized in a way which was easy for the audience to follow with some type of media support. Presentation had minimal errors in spelling, punctuation, and grammar.	Used verbal and nonverbal skills appropriate for a professional setting. Information was organized in a way which the audience could follow with some type of media support. Presentation had a few noticeable errors in spelling, punctuation, and grammar	Nonverbal and verbal skills were not appropriate for a professional setting. Presented information in a way that was hard for the audience to follow and/or didn't use media for support. Presentation had several noticeable errors in spelling, grammar, and punctuation that distracted the audience.

Strands (main ideas taught in unit)	
ELA	Non-fiction reading, fiction reading, multimedia, fictional writing
Math	Conversions, rate table
Science	Physical Science
Social Studies	History
Vocabulary	
ELA	**Protagonist**- the principal character in a literary work **Antagonist**- person working against the protagonist, or main character **Analyze**- to examine closely **Evidence**- something that furnishes proof **Interpret**- to give or provide the meaning of; explain **Inference**- a conclusion drawn from facts **Theme**- main idea **Irony**- the use of words to express something different from and often opposite to their literal meaning **Idiom**- figure of speech that is meant to be taken figuratively instead of literally **Simile**- a comparison using "like" or "as"

Math	**Metric System** – Measurement system used around the world and in science in the US **Customary/Standard System** – Measurement system used specifically in the US (based on the English system) **Conversion** – A change in units **Rate table**: a table comparing two related quantities **Rate**: a ratio between two related quantities
Science	**Mass**: A measure of how much matter is in an object. **Volume**: The amount of space an object takes up. **Kinetic** energy: The energy of matter in motion. **Force**: A push or pull on an object. **Potential energy**: Energy that is stored and waiting for use. **Physical change**: A change in a substance that does not change its identity. **Law of Conservation of Mass**: The principle that the total amount of matter is neither created nor destroyed during any chemical or physical change. **Chemical change**: A change in which one or more substances or break apart to form new substances. **Energy**: The ability to do work, or cause a change. **Thermal energy**: The total energy of motion in the particles of a substance. **Matter**: Anything that has mass and occupies space. **Renewable resource**: A resource that is either always available or is naturally replaced in a relatively short time.
Social Studies	**Culture**- a society's "WAY OF LIFE." It includes the beliefs, values, ideas, and artifacts that are shared by people. **Cultural diffusion**- the movement of these ideas or goods from place to place or culture to culture.

Key Questions	ELA	Math	Science	Social Studies
	How does reading fiction based on a historical event help you understand that event? How do sports connect with other aspects of life?	*How do conversions help us solve real world problems?* *How have newer construction methods affected the rates of amusement park rides?*	*How are principles of physics reflected in the world of the past and present?*	*What is cultural diffusion? How is ancient Aztec engineering similar and different to modern coding?*

Hook for Unit	**Creating an Amusement Park Ride- STEM challenge** http://chicagohistory.org/static_media/pdf/historylab/chm-historylabffw01.pdf
Literature Component	Fiction- Electric Summer (Scholastic, November 2013) http://scope.scholastic.com/issues/11_01_13/Fiction-And-Informational-Text Nonfiction- "Artists Uses Dribbling Skill to Paint Soccer Stars" http://www.dogonews.com/2014/6/29/artist-uses-dribbling-skills-to-paint-soccer-stars
Writing Closure	Roller coaster group presentation; writing code using Khan Academy to create and animate a roller coaster simulation.
Materials Needed for Culminating Event	Trifold Posterboards Materials to build roller coasters Rubrics for grading

Standards: Indiana State Standards	
ELA Indiana State Standards.	**6.RL.2.1** Cite textual evidence to support analysis of what a text says explicitly as well as inferences drawn from the text. **6.RL.2.2** Determine how a theme or central idea of a work of literature is conveyed through particular details; provide a detailed, objective summary of the text. **6.RL.2.**3 Explain how a plot unfolds in a series of episodes as well as how the characters respond or change as the narrative advances and moves toward a resolution. **6.RL.4.1** Compare and contrast the experience of reading a story, play, or poem with listening to or viewing an audio, video, or live version of the text, including contrasting what they "see" and "hear" when reading the text with what they perceive when they listen or watch. **6.RN.4.2** Integrate information presented in different media or formats (e.g., visually, quantitatively, verbally) to demonstrate a coherent understanding of a topic or issue. **6.W.3.3** Write narrative compositions.
Math Indiana State Standards.	**6.GM.1** Convert between measurement systems (English to metric and metric to English) given conversion factors, and use these conversions in solving real-world problems. **MA.6.AF.9:** Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane.

Science Indiana State Standards.	Explain that all objects and substances in the natural world are composed of matter in different states with different properties. **(6.1.1, 6.1.2, 6.1.3)** Understand that there are different forms of energy with unique characteristics. **(6.1.4, 6.1.5, 6.1.6, 6.1.7)** **6.1.1** Understand that the properties and behavior of matter can be explained by a model that depicts particles representing atoms or molecules in motion. **6.1.2** Explain the properties of solids, liquids and gases using drawings and models that represent matter as particles in motion whose state can be represented by the relative positions and movement of the particles. **6.1.3** Using a model in which matter is composed of particles in motion, investigate that when substances undergo a change in state, mass is conserved. **6.1.4** Recognize that objects in motion have kinetic energy and objects at rest have potential energy. **6.1.5** Describe with examples that potential energy exists in several different forms (e.g., gravitational potential energy, elastic potential energy and chemical potential energy). **6.1.6** Compare and contrast potential and kinetic energy and how they can be transformed from one form to another. **6.1.7** Explain that energy may be manifested as heat, light, electricity, mechanical motion, and sound and is often associated with chemical reactions.
Social Studies Indiana State Standards.	**6.1.1** Summarize the rise, decline, and cultural achievements of ancient civilizations in Europe and Mesoamerica. **Example**: Aztecs **6.3.10** Explain the ways cultural diffusion, invention, and innovation change culture. **6.3.11** Define the terms anthropology and archeology and explain how these fields contribute to our understanding of societies in the present and the past.