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Project Proposal for Capstone Project
EDTC 710 & EDTC 750

Introduction:

Since I began teaching, the culture of technology has changed significantly. In today's society from the time our students are born, they are exposed to technology. I can still remember when I was in second grade that going to the computer lab with my class happened only once a month. Students today are even more versed in the latest technology than we are as teachers. The need to integrate and teach through technology is essential in creating 21st Century Learners (Technology Integration for the New 21st Century Learner). The needs of our students are better met when we utilize the technologies available to us in our schools. This allows you to plan for more individualized instruction in a class of 21 or more students. You as the teacher become a catalyst for learning, allowing your students to learn through discovery and creation rather than direct instruction (Technology Integration for the New 21st Century Learner).

Having students engage in science practices helps students to develop the skills they need in our ever-changing world. Providing students with opportunities to pose questions and define problems, develop and test models, investigate and engage in arguments for evidence, allows them to better understand the world around them (Next Generation Science Standards). Through this student centered, inquiry-driven project, students will learn how the Earth is made up of complex, interconnected systems and is part of a much larger universe. Providing students with first-hand opportunities to interact with information heightens their curiosity, interest and motivation. When students engage these areas of their brains, they form connections and are able to store what they learn in their long-term memory (How the Brain Learns). Once this is stored, students will be better able to investigate the problems facing our planet today and in the future.

This Capstone project will span 3 – 4 weeks. It will begin with a broad lens and narrow during the course of the project. Students will have many opportunities to explore, investigate, analyze, evaluate and design. Through this project, students will tap into prior knowledge and create new connections, forming long-term storage. Students will be highly engaged with the information and continue to develop their 21st Century learning skills.

Objectives:

The targeted audience for the designed project are second graders. The objectives directly correspond to the current second grade curriculum, while integrating additional technology throughout. Through this Capstone project, students will understand that there are different kinds and shapes of land and bodies of water. In addition, students will explore how Earth's events can occur very slowly and quickly. Students will then investigate the effects that weathering and erosion have on the shape of the land. Finally, this project incorporates opportunities for students to design solutions to slow down or prevent the effects of weathering and erosion.

By the end of the project, students will be able to:

- Identify and represent the shapes and kinds of land and bodies of water in an area.
- Identify events that have shaped the Earth's surface.
- Classify changes to the Earth's surface as slow or rapid.
- Compare design solutions that slow or prevent the way wind and water change the Earth's surface.

Procedures:

I will start by drawing on the students' prior knowledge from our unit on Matter. I will pose the question, "Is the Earth a solid or liquid or gas?" This will be followed by a class game of 4 Corners, students in each corner will have to support their idea with prior knowledge. Students

will then watch a video to discover the answer to the posed question and confirm, modify or change their thinking. Following the video students will complete an informal quiz on their white boards. On the following day, as a class we will create an anchor chart of the ways our Earth is a solid, liquid or gas. Students will then create a “Layers of the Earth Flipbook” and record what the layers of the Earth consist of.

This will lead into the following lessons for landforms and bodies of water, along with how they change through weathering and erosion. Read alouds, videos and inquiry-based activities will be used to introduce each new topic and discussion.

The following more specifically outlines the activities, technologies, standards, assessments, essential questions and multiple intelligences incorporated in this project:

Technology:

- A WordPress site will be used to create this project.
- Videos and quizzes from BrainPOPjr.com, videos from Crash Course Kids, Bill Nye the Science Guy and Magic School bus
- Screencast-O-Matic and a document camera to create digital read alouds and presentations.
- A Prezi presentation of the different landforms and bodies of water.
- Smartboard will be utilized to display the site and all included videos and SMART board activities.
- Students will utilize Chrome Books to access site and digital resources.
- Google forms will be created and utilized as “check-ins” (quizzes)
- STEM Challenge with journal
- Student clay creations of landforms and bodies of water

Standards:

Next Generation Science Standards

- **2-ESS1-1. Earth's Systems -** Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
- **2-ESS2-1. Earth's Systems -** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.
- **2-ESS2-2. Earth's Systems -** Develop a model to represent the shapes and kinds of land and bodies of water in an area.
- **2-ESS2-3. Earth's Systems -** Obtain information to identify where water is found on Earth and that it can be solid or liquid.
- **K-2 -ETS1-1. Engineering Design -** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- **K-2-ETS1-2. Engineering Design –** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
- **K-2-ETS1-3. Engineering Design -** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Technology Standards

- **8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
  - 8.1.2.A.4 - Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
  - 8.1.2.A.6 - Identify the structure and components of a database.
  - 8.1.2.B.1 – Illustrate and communicate original ideas and stories using multiple digital tools and resources.
  - 8.1.P.C.1 – Collaborate with peers by participating in interactive digital games or activities.
  - 8.1.2.E.1 – Use digital tools and online resources to explore a problem or issue.
- **8.2 Technology Education, Engineering, Design, and Computational Thinking – Programming:** All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
  - 8.2.2.A.4 – Choose a product to make and plan the tools and materials needed.
  - 8.2.2.A.5 – Collaborate to design a solution to a problem affecting the community.
  - 8.2.2.C.1 – Brainstorm ideas on how to solve a problem or build a product.
  - 8.2.2.C.2 – Create a drawing of a product or device that communicates its function to peers and discuss.
  - 8.2.2.D.1 – Collaborate and apply a design process to solve a simple problem from everyday experiences.
  - Identify the strengths and weaknesses in a product or system.

ISTE Standards

- **1. Empowered Learner –** Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.
- **3. Knowledge Constructor -** Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
- **4. Innovative Designer -** Students use a variety of technologies with a design process to identify and solve problems by creating new, useful or imaginative solutions.
- **6. Creative Communicator –** Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate for their goals.
- **7. Global Collaborator -** Students use digital tools to broaden their perspectives and enrich their learning with others and working effectively in teams locally and globally.

Assessments:

- Landforms/Bodies of Water Cut and Paste
- Experiments/Labs will be documented with Scientific Method Lab organizers
- Formal argument topic written responses
- Brain pop Jr. quizzes, both informal collection (whiteboards, 4 corners) and printed
- Summative Assessment: Students will choose 3 landforms and 3 bodies of water to build with playdough or clay
- STEM Challenge(s) with STEM mini journal and Design Challenge Templates

Essential Questions:

- What are Earth's layers?
- What is a landform and what are the basic physical qualities of each one?
- How do wind and water change the shape of the land?
- How are people affected by the different rates of change to Earth's surface (quick versus slow changes)?
- How can changes to the Earth be slowed or prevented?

Multiple Intelligences and Learning Styles examples:

- **Bodily - Kinesthetic** students will enjoy the hands on activities, such as; the erosion lab and STEM challenges. Also during 4-Corners game, this learning style will be met.
- **Visual Spatial Learner** students will enjoy the videos, Prezi's, interactive read-alouds, and constructing their groups "solution" during STEM activity.
- The **Musical Learner** will enjoy the videos that include music. These students will also enjoy the erosion, layers of the earth and landform songs.
- Students use their **Linguistic Intelligence** when learning new vocabulary, sharing their teams plan during STEM challenges and during argument topic writing.
- The **Naturalistic Learner** will enjoy sorting the landforms and bodies of water and the virtual tour of these.
- Students with **Logical-Mathematical Intelligence** will enjoy utilizing resources to provide evidence of Earth's events that occur quickly and slowly. Students will also use this when designing a way to prevent wind and water from changing the shape of the land in the STEM challenge.
- The **Intrapersonal Learner** will enjoy independently completing the landform and bodies of water cut and paste assessment, writing their arguments, and completing Google forms.
- Students with **Interpersonal Intelligence** will enjoy working with their group members during the Earthquake STEM Design Challenge and Erosion Lab.

Impact:

Teaching with an inquiry-based approach creates connections and makes learning fun and meaningful. When we can create meaningful connections between what we are learning in the

classroom and what is going on in their world, we create even deeper meaning for our students. In recent weeks, students have become aware of the heavy forms of weathering our part of the world has experienced. These rapid changes have had a huge effect on people. Students will be able to create sense and meaning to these events, have a greater understanding of why these changes happen, as well as, the effect they have on people and animals. It may also inspire them to come up with creative ways to slow down or prevent the changes.

This project will expose Second Grade students within my building and across the district to the same information, materials, and resources. The WordPress site will be designed with all needed information, materials and resources attached so that any Second grade teacher will be able to easily access, follow and implement with their class.

References:

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