1. What is our purpose?

1a) To inquire into the following:

- **transdisciplinary theme**

How the World Works

An inquiry into the natural world and its laws; the interaction between the natural world (physical and biological) and human societies; how humans use their understanding of scientific principles; the impact of scientific and technological advances on society and on the environment.

- **central idea**

Science and technology may be a catalyst for environmental and societal change.

Class/grade: 4th Age group: 9-10

School: Poe Elementary School code: 49497

Title: Science and Technology Affect Environments

Teacher(s): Lauren Baldwin, Elizabeth Finch, Laura Gonzalez, Troy Hall, Mary Haden Harris, Emily Hartzog

Date: May 1, 2021-June 14, 2021

Proposed duration: 6 weeks

1b) Summative assessment task(s):

What are the possible ways of assessing students' understanding of the central idea? What evidence, including student-initiated actions, will we look for?

Summative Assessment 1

Students will identify a need in daily life and create an innovation to make the task easier and more efficient.

Drawing/small model of how the student's innovation would work.

Students must have a detailed description of why the innovation would help in daily life.

Create an advertisement to promote the innovation.

Must include:

Realistic innovation – 20 pts

Visual representation- 20 pts

Detailed written description (How does it work? Why is it helpful?)- 40 pts

Ideas and descriptions clearly expressed- 20 pts

Summative assessment 2:

Students may choose a scientific discovery that has had (either positive or negative) environmental impact on the community, or world.

They can create a PowerPoint or Google slide presentation, a paper pamphlet or a video (or something else approved by teacher)

2. What do we want to learn?

What are the key concepts (form, function, causation, change, connection, perspective, and responsibility, reflection) to be emphasized within this inquiry?

Key Concepts: Change, Form, Function

Related Concepts: interaction, environment, discovery

What lines of inquiry: will define the scope of the inquiry into the central idea?

How technology has advanced societies
Environmental impact of scientific discoveries
Innovations that have led to efficiency

What teacher questions/provocations will drive these inquiries?

Display daily commonly used objects around the room. How have they impacted society? Masks, toilet paper, face shields, gloves, sanitizing wipes

What do these items have in common?

How has this item made life easier?

How has this impacted the environment?

Provocation:

In person and virtual students were limited only to teams for technology for a morning. How would they complete assignments?

Must include: Detailed written description of discovery, a simple explanation of how it works and its impact on environment. Why is it beneficial or harmful? 40 pts Visual representation of the discovery and its impact (hand drawn art, photos, images from internet 15 pts Ideas and description clearly expressed in written form 30 pts Ideas and description clearly communicated in presentation. 15pts	

3. How might we know what we have learned?

What are the possible ways of assessing students' prior knowledge and skills? What evidence will we look for?

Class Brain Storm- In Person and virtual students will write on Jamboard (an interactive Whiteboard system): innovations that have aided in our society so far. Teacher will monitor and save so that class will be able to refer back to it and how it relates to LOI.

What are the possible ways of assessing student learning in the context of the lines of inquiry? What evidence will we look for?

LOI 1: Timeline presentations- students will pick one innovation to present as to how it changed society.

LOI 2: Students will interpret the class discussions the scientific impacts that impacted society through creating and performing a drama.

LOI 3: Judge and defend during a classroom discussion which innovation is most efficient.

4. How best might we learn?

What are the learning experiences suggested by the teacher and/or students to encourage the students to engage with the inquiries and address the driving questions?

LOI 1: The teacher will give students a century to research about the different innovations that occurred during that particular century. The students will make a timeline in order with at least five different innovations that occurred during that century (1700s, 1800s, 1900s, 2000s). Duration one week.

LOI 2: The teacher will facilitate a time travel discussion with students comparing and contrasting the environmental changes over time due to scientific discoveries.

Focus on oil industry- before and after Spindle Top

ENGERY SECTOR OF HOUSTON- how has Houston's population changed.

Look at other countries that have Oil as one of their major exports. Look at how global cultures are changing the Houston dynamics, economy, and population. Look at positive and negative effects.

Medical Technology- Global medical center

INNOVATIONS based on needs for the energy businesses.

LOI 3: The teacher will take away all electrical innovations in the in person classroom until after lunch time. Virtual students will use only Teams. The students will adapt to the new environment and utilize alternative resources to adapt.

What opportunities will occur for transdisciplinary skills development and for the development of the attributes of the learner profile?

SKILLS: research, communication, thinking, social, self- management

Students research a global problem like drought or famine. They will think of solutions to the problem and communicate innovation ways to find solutions within small peer groups. Students will use self-management within their cooperative learning groups to manage time and to stay on task.

ATTRIBUTES:, open-minded, reflective, inquirers, communicators, thinkers,

	knowledgeable Students will reflect on global problems. They will think of solutions to issues that affect other communities around the globe. They will be open minded as they plan solutions to the problems. Students will gain knowledge of the global community. They will present their new innovative solutions to the class through oral presentations. Students will ask questions and inquire into other groups' solutions.

5. What resources need to be gathered?
What people, places, audio-visual materials, related literature, music, art, computer software, etc, will be available?

Safe YouTube, BrainPop, Mistakes That Worked Charlotte

Jones, Sciencesaurus, Texas Studies pages, HMH textbook and leveled readers, MyOn; Poe Library online resources

HAM videos- HOUSTON ARTS MEDIA, https://teachingtexas.org/

How will the classroom environment, local environment, and/or the community be used to facilitate the inquiry? Computer, classroom /school library;

Speakers from the community specializing in science careers, including technology, oil, and medicine are from all over the world and spend time in the Houston area and have students in our school. We have been able to access them to present topics on a student level via Teams.

Classroom environment without electronics for a period of the day; community leaders in science, including medicine or other disciplines will make virtual presentations (this also includes parents who are temporarily here in US and are from other countries). This may also include relatives living in other countries due to virtual technology.

The computer/ library will be used to assist with research skills.

Reflecting on the inquiry

6. To what extent did we achieve our purpose?

Assess the outcome of the inquiry by providing evidence of students' understanding of the central idea. The reflections of all teachers involved in the planning and teaching of the inquiry should be included.

How you could improve on the assessment task(s) so that you would have a more accurate picture of each student's understanding of the central idea?

Students' products were too beyond reality so we have created guidelines for them to focus on realistic global situations such as Covid 19 pandemic, drought, and famine.

What was the evidence that connections were made between the central idea and the transdisciplinary theme?

Students made the connection between advances in technology and how it affects the environment. Students focused too much on advances in technology and not on their impact on the environment or society. Their ideas were more ego-centric, focusing on material possessions. Students also had a hard time understanding that technology can be mechanical not just electronic. Upon reflection, we have changed the parameters of the summative assessment to help direct their focus on global issues.

7. To what extent did we include the elements of the PYP?

What were the learning experiences that enabled students to:

- **develop an understanding of the concepts identified in "What do we want to learn?"**

  Students were able to understand the function of technology and how advancements improve quality of life and sometimes can harm quality of life.

- **demonstrate the learning and application of particular transdisciplinary skills?**

Students had to think of an innovation to help improve their daily life. Students communicated their innovation through an advertisement.

- **develop particular attributes of the learner profile and/or attitudes?**

In each case, explain your selection.

Students reflected on their own needs and thought of innovative ways to improve their lives. Students were open-minded as they explored different ideas through peer discussion and brainstorming. Students showed creativity in designing their product.

Reflecting on the inquiry

8. What student-initiated inquiries arose from the learning?

Record a range of student-initiated inquiries and student questions and highlight any that were incorporated into the teaching and learning.

What is technology?

What is considered an innovation?

What is a patent and a copyright?

What is the difference between and copyright and a trademark?

At this point teachers should go back to box 2 "What do we want to learn?" and highlight the teacher questions/provocations that were most effective in driving the inquiries.

What student-initiated actions arose from the learning?

Record student-initiated actions taken by individuals or groups showing their ability to reflect, to choose and to act. Examples of actions include further research, refining innovations, and investigation of new topics.

After discussing local and global topics that have evolved from the use of technology and scientific discoveries, the students gathered information on their topics and created a persuasive presentation. The students took action by informing others of effects of technology and scientific discoveries. See teacher notes for improving student-initiating action.

9. Teacher notes

2019/2020

Students had a hard time creating something realistic…some ideas were too fantastical. Some innovations did not meet an actual need.

Kids had a hard time explaining their innovation.

Might be too abstract. REVIST PLANNER

Focus on global issues- famine, drought, civil unrest, and natural disasters. If able, stick to current events within last five years.

2020/2021

We are in the process of revising this unit of inquiry to include another choice of assessment that allows students to choose a discovery in technology that has had either a positive or negative impact on our environment.