

Title: Need more time to decide

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Rationale :

The purpose of this action research project is to teach my students to follow and implement the steps of scientific investigations. By doing a biotechnology/pathology lab on Elisa- Dengue, I am targeting 9th-12th grade student's interest for Scientific Research. The overall idea is to give them a glimpse into a scientist life. While doing the lab they will be immersed into scientific research, which will help them to understand the required patience, hard work, creativity, and unconventional thinking to be a scientist.

As most educators already acknowledged "Today's Children will hold the future of the Nation". It is the duty of Teachers, parents and adults to dispense quality education to the next generation. There is a need to involve and prepare young men and women to continue the great work of Scientist "ongoing". I also feel that Science Education holds importance because it not only trains people to be follow systematic procedures, but it also motivates them to be curious and persistent, which is a pre-requisite for any profession.

I chose this lab because it is close to reality as well serves the bigger Idea of preparing them to the future needs of the society. It will cater to all the styles of learners. I hope to complete this lesson plan within 3 block class periods. It includes Background knowledge of the topic, simulation lab and a follow up.

I am also planning to merge the Effect of EL NINO ON THE LIFE PEOPLE with Water borne and food borne pathogens from ICORE. In this topic we talk about economical losses as well as health issues because of the movement of water from Warm water over cold water, which changes the climatic condition that is more favorable to motivate species' roles, which otherwise may remain dormant.

Abstract :

As a part of Action Plan for Emerging Pathogens Project. I plan to use this biotechnology lab as part of teaching Scientific Investigation during first few days of school. I plan to complete this lab in three class period. I plan to enrich students with background knowledge, Simulation lab followed by Closing of the topic through critical thinking questions. It would cater to the needs of all styles of the learners. Students would be interested because of the closeness to the reality or fatality of the diseases. First day will be used in developing the knowledge about Dengue, Second Day is planned to explain the lab procedures and then students will complete the lab. And the third day will be Lab follow Up. Clarifying Questions if any and extending the topic.

I also Plan to use Salomonella, Vibrio Cholera and Ecoli Lab while teaching **EARTH SPACE SIENCE, Unit: "OCEANS", Sub unit: "EFFECT OF EI NINO ON THE LIFE OF PEOPLE"**. We would not only discuss the Financial part but also spread of diseases due to contamination of Water, at that time I plan to develop back ground knowledge, Lab procedures followed by lab as well Lab follow up to culminate the objective of developing awareness of Emerging Pathogens. Student will complete Survey and get the demographic of the disease in Jacksonville in comparsion to rest of the USA through ArcGIs Mapping. I plan to use 2-3 class period for completing this Lab.

However to develop the basics of the Labs on how to use this lab equipment and measurements, I will also use Designer plates lab from ICORE. It would be 20 minute activity.

Learning Outcomes:

Students will be to identify, compare, and/or contrast the types of infectious agents that affect the human beings as well acknowledge the steps of precautions and cure.

Standards:

Benchmark Number:	<p>SC.912.N.1.1, SC.912.N.1.2, SC.912.N.1.3, SC.912.N.1.4, SC.912.N.1.5, SC.912.N.1.6, SC.912.N.1.7, SC.912.N.2.5, SC.912.N.3. 1.</p> <p>Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:</p> <p>A: Scientific inquiry is a multifaceted activity; The processes of science include the formulation of scientifically investigable questions, construction of investigations into those questions, the collection of appropriate data, the evaluation of the meaning of those data, and the communication of this evaluation.</p> <p>B: The processes of science frequently do not correspond to the traditional portrayal of "the scientific method."</p> <p>C: Scientific argumentation is a necessary part of scientific inquiry and plays an important role in the generation and validation of scientific knowledge.</p> <p>D: Scientific knowledge is based on observation and inference; it is important to recognize that these are very different things. Not only does science require creativity in its methods and processes, but also in its questions and explanations.</p> <p>SC.912.N.4.2</p> <p>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).</p> <p>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively.</p> <p>SC.912.E.7</p> <p>The scientific theory of the evolution of Earth states that changes in our planet are driven by the flow of energy and the cycling of matter through dynamic interactions among the atmosphere, hydrosphere, cryosphere, geosphere, and biosphere, and the resources used to sustain human civilization on Earth</p>
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- LACC.68.RST.1.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- LACC.68.RST.2.4 Determine the meaning of symbols, key terms, and other domain specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
- LACC.68.WHST.3.9 Draw evidence from informational texts to support analysis reflection, and research.

Lessons (5E Model) and Timeline Overview (3 instructional days): ELISA –Dengue:

Day 1 Engage: Develop the knowledge about the Dengue, Pre Cautions and Treatment.

Students will work in groups to collect information. I will assign different component of study to Each group member to collect information such as Dengue Pathogen, mode of infection, Pre-caution and treatment before hand. In class each group will compile their information to Prepare either a poster board or power point.

Followed by Teacher Feed back

Day 2 Explain/ Explore: Lab Safety Instructions and lab procedure, Simulation lab from ICORE

Day 3 Extend: STEM careers relating to life science/pathology/disease –video clips will be used as a springboard for discussion on careers related to this field of science. Public Service Announcement - representations of the sanitation and public health systems in countries that have recently experienced cholera outbreak

Day 3 Evaluate: This includes a trifold presentation board, poster, or a brochure or powerpoint.

Lessons (5E Model) and Timeline Overview (3 instructional days): Water Borne/food Diseases- Salmonella, Vibrio Cholera, E. Coli.

Day 1 Engage: Develop the knowledge about the Salmonella, Vibrio Cholera and E.coli Disease symptoms, infection, Pre Cautions and Treatment.
Students will work in groups to collect information and samples of water, food from unhygienic sites . I will assign different component of study to Each group member to collect information such as symptoms of Pathogen, mode of infection, Pre-caution and treatment before hand. In class each group will compile their information to prepare either a poster board or power point.
Followed by Teacher Feed back

Day 2 Explain/ Explore: Lab Safety Instructions and lab procedure, lab from ICORE

Day 3 Extend : video clips will be used for discussion on representations of the sanitation and public health systems in countries that have recently experienced pathogens outbreak

Day 3 Evaluate: This includes a tri fold presentation board, poster, or a brochure or powerpoint.

Lessons (5E Model) and Timeline Overview (20 minutes of 1 instructional day): Designer Plates Lab from ICORE

Explain: I will demonstrate the use of micro Pipettes and well plates, instruction for the lab etc

Engage and Explore: In Pre lab students will educate them how to read and adjust the micro pipette and later they do the lab.

Evaluate: Participation, execution of design and pre lab.

Extend: Use of measurements (micro pipette) later in Elisa Lab.

Data Collection Techniques:

- Pathogen spread surveys to monitor in Jacksonville as well other neighbouring cities or Whole country
- Student work as demonstrated in representations(poster board, power point, brochure)
- Back ground knowledge summaries if I use one.
- Higher order questions (Lab worksheet)
- Participation.

Use of Equipment Lockers/Field Trip to UF:

1. Micro Pipettes for designer Lab # 20
2. Detecting water borne pathogens by Colorimetric method
3. Elisa Simulation Lab
4. Dengue Curriculum Kit
5. Bacterial Slide Set
6. Classroom book set - The Immortal Life of Henrietta Lacks
7. Contagion Movie
8. Water Molecules Kit
9. Water Microarray Simulation kit
10. Vortex
11. Micro Centrifuge tube
12. Gel electrophoresis kit

Connections to ICORE Summer Institute:

1. I would like to have few micro pipettes in my classroom for the rest of the year.
2. Can I also get High magnification Micro Scopes to see slides (pathogens).
3. I may plan for classroom visit later in year is it okay.
4. Can I or my colleagues buy more droppers through I core programme.

Improvement on Traditional Teaching Techniques:

I would like to thank ICORE for giving me the opportunity to learn more about “Emerging Pathogens” I added on few more labs, and teaching strategies. I would like to implement them in the regular classroom first then add few more in my Scientific Research Club (After School Activity) with main Idea to develop research based strategies in upcoming generations.

Budget and Budget Justification: I need your help on this

Item	Cost	Vendor