Title: Gasp!!!.....the RETURN OF SMALLPOX???!!!!...

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Abstract (150 word limit):
• Introduce students to the structure and function of viruses and virus replication. Role of RNA in the cell via reverse transcription viruses.
• Extract DNA from plant cells and understand the importance of the genetic code stored within the nucleotide sequence in DNA molecules and how those codes differ between organisms----BRAIN (strawberry) DNA EXTRACTION-beginning steps to determine if suspected smallpox patient indeed died of smallpox
• Learn about current biotechnology research practices by reviewing PCR techniques through activity and lab------ PCR lab/simulation PCR dash??? -beginning steps to determine if suspected smallpox patient indeed died of smallpox
• Role of proteins in biotechnology (includes review of immune system response; protein function)—ELISA testing simulation-determine if others have been exposed to smallpox by looking for antibody production
• Explore various aspects of careers in biotechnology---Viral Quest Curriculum lesson 10
• Create a board game titled “OUTBREAK” that sums up the unit------classroom supplies
  o Game Requirements
    ▪ DNA structure and function
    ▪ RNA structure and function
    ▪ Virus structure and function
    ▪ Smallpox symptoms/mechanism
    ▪ Biotechnology lab practices and careers

Rational
1. Scenario/Framework: “Is it possible that an outbreak of smallpox is upon us? A patient has been presented with the symptoms of smallpox. Through this unit students will investigate the properties of the virus and determine if a smallpox outbreak has emerged?

1. Students assume the role of the four stages of biotechnology
   a. Educator-learn the basics of the subject (i.e. DNA structure, complementary base-pairing, RNA structure, amino acid/protein relationship)---professor?
   b. Research and Design- conducts the labs that supplies the evidence to support theories
   c. Community- research environmental behaviors, practices, knowledge that could lead to a smallpox outbreak
   d. Government- laws/regulations to +/- knowledge that is emphasized in the policy making (eradicate smallpox)

Description of teaching unit or module(s), including expected outcomes
a. Background information of smallpox
b. Pre-read “The Demon in the Freezer” by Richard Preston with discussion questions/quizzes
c. Internet (webquest?) research/article review emphasizing the impact of smallpox on society over history (interdisciplinary)
d. symptoms of smallpox and mortality rates

2. Educator Role-learn the basics of the subject matter according to the NG-SSS, teacher-led discussion, vocabulary review, UF faculty talk via Skype (Dr. McFadden)???

3. Researcher Role-
   a. DNA extraction lab
   b. PCR simulation/dash ???
   c. ELISA simulation
   d. Viral Quest Curriculum

4. Community Role-
   a. Webquest/research human impact on environment (behaviors that lead to epidemics)
   b. Campaign posters to help raise awareness

5. Government Role
   a. Webquest/research current and past laws/regulations that were approved to address the smallpox virus, and investigate current laws/regulations regarding potential epidemic microorganisms
   b. Students create a powerpoint presentation for classroom display

6. Board Game Unit project
   a. Create board game entitled “Outbreak“-must address the major subtopics of the unit.
      i. Game will be created by student working groups
      ii. Game will address major subtopics of this teaching unit
      iii. Game will be played and analyzed by classmates
      iv. Game will be followed up by a student reflective writing

Data collection techniques and/or student assessments
1. Teacher-made assessments throughout educator, researcher, community, and government roles. For example, tests, vocabulary quizzes, bell ringer questions, wrap up questions, etc.
2. Students will self assess and cross assess via powerpoint presentation notes, board game analysis, etc.
3. Laboratory questions will follow-up laboratory components

If applicable, use of equipment lockers and/or UF visit (either in the classroom or UF campus)
1. DNA extraction lab (strawberry) or Cheek cells DNA extration
2. Micropipetting practice locker
3. PCR lab locker
4. PCR Dash locker
5. ELISA simulation locker
6. Website access: CPET teacher resources link
7. Faculty Talks via Skype (Dr. Grant McFadden—“Viruses: Friend or Foes”)

ICORE summer institute elements specifically included (UF connections)
1. Viral Quest Teacher guide
2. PCR lab and Dash
3. ELISA simulation locker
4. Faculty
Literature cited

1.

Budget and budget justification

1. 26 copies of “The Demon in the Freezer” $7.99 each x 30 = $239.70