INTRO TO NANOTECHNOLOGY AND BIOSENSORS
5E Inquiry Lesson Plans - Grades 7-12
Lesson Plan #1: Bacteria & Viruses: a threat to the existence of the human species?
one 45-55 minute class period

Even though there is not any information here on how we detect bacteria and viruses, the video adequately shows the problems there are with bacteria and viruses. It is important to stop the video where they are shown collecting samples and explain what it currently takes to detect bacteria and viruses. The idea is to lead the students into the project of bacteria/virus detection and detection time. This is the definition of our problem! This is the basis and purpose of the entire program.

ENGAGE: Have students generate a list on the board of all the bacteria and viruses they've ever heard about or experienced. What types of problems with bacteria/viruses have they heard about on the news or experienced in their lives? The teacher can have the list as detailed as the level of the students (i.e.: a high school biology class will differentiate between bacteria and viruses, whereas a 7th grade science class would just list them all together).

EXPLORE: Show the first half of “Understanding Bacteria” movie (about 25 minutes long). Stop at appropriate times to have students comment on the following: Depending on the level of the students, you could have them answer these questions on paper for more accountability.
1. Could understanding more about bacteria and viruses be vital to the survival of the human species?
2. What do they do with the samples they’ve collected? Why?
3. How do we currently detect bacteria and viruses?
4. Since it takes 2 to 7 days to detect bacteria or viruses in your food, water or blood stream, what problems are there with this lengthy wait time?
5. Why is it important to learn how to detect bacteria and viruses in less than 2 to 7 days? Why would it be beneficial to you, your family & friends, your community and even your country?

EXPLAIN: Either during the movie or after the movie (teacher judgment here), direct or explain the correct answers to the questions above in the explore stage. Students will have questions that need to be answered also.

ELABORATE: After the movie and discussions have the students write a paragraph explaining what they think we should be doing about bacteria/virus detection and why we should be doing it. What are the consequences if we don’t? What ideas do you have on how to get detection time down?

EVALUATE: Evaluation is on any notes you may have had the students take for the questions in the explore phase and on the Elaborate paragraph they have written.