River City and the National Science Education Standards

The National Science Education Standards (National Research Council, 1996) list seven content standards for K-12 school science. River City maps to five of these standards.

1. **CONTENT STANDARD A:** As a result of activities in grades 5-12, all students should develop:
   - Abilities necessary to do scientific inquiry
   - Understandings about scientific inquiry
     a. River City is an inquiry-based project;
     b. As an inquiry-based project, students gather data, hypothesize, use tools to test, analyze and make conclusions;
     c. Students are guided to learn the skills necessary to conduct scientific inquiry;
     d. Simultaneously, they engage in an authentic and personal inquiry investigation.

2. **CONTENT STANDARD C:** As a result of their activities in grades 5-12, all students should develop understanding of:
   - Structure and function in living systems (grades 5-8)
   - Populations and ecosystems (grades 5-8)
   - Diversity and adaptations of organisms (grades 5-8)
   - Interdependence of organisms (grades 9-12)
     a. River City helps students understand disease and three forms of disease transmission;
     b. Students are guided to understanding the effect of disease on humans;
     c. Students investigate the niche of microorganisms;
     d. Students see the interactions between humans, microorganisms and the ecosystem they both inhabit;
     e. Students learn the role of microorganisms in causing disease.

3. **CONTENT STANDARD E:** As a result of activities in grades 5-12, all students should develop:
   - Abilities of technological design
   - Understandings about science and technology
     a. Students are asked to design virtually an intervention that will potentially solve the River City epidemic;
     b. Students evaluate their intervention to see if it did indeed affect the spread of disease;
     c. Students learn that technological inventions such as microscopes drive scientific discoveries by expanding scientists’ ability to make observations;
     d. Students investigate the intended and unintended consequences of a newly introduced technological invention.
4. CONTENT STANDARD F: As a result of activities in grades 5-12, all students should develop understanding of
   - Personal health
   - Community Health (grades 9-12)
   - Populations, resources, and environments (grades 5-8)
   - Environmental quality (grades 9-12)
   - Natural hazards
   - Human-induced hazards (grades 9-12)
   - Risks and benefits
   - Science and technology in society
     a. Students explore three different diseases with varying health impact;
     b. Students discover that there are human-caused health hazards in the river;
     c. Students’ investigations lead them to understand that the causes of these hazards stem from natural occurrences such as heavy rain, water stagnation as well as human impact;
     d. Through experimentation, students are able to test out their hypothesis of the cause of the sudden increase in disease before making recommendations;
     e. Students need to weigh the advantages and drawbacks to various interventions before choosing what they view as the best option;
     f. Students join politicians, doctors, and university professors in working together to understand the impact on the poorest segment of the River City population.

5. CONTENT STANDARD G: As a result of activities in grades 5-12, all students should develop understanding of:
   - Science as a human endeavor
   - Nature of science (grades 5-8) and of scientific knowledge (grades 9-12)
   - History of science (grades 5-8)
   - Historical perspectives (grades 9-12)
     a. Students participate in science along with men and women in various virtual roles;
     b. Students are exposed to concepts of nature of science;
     c. Students are encouraged to base their conclusions and decisions on evidence and to re-evaluate them in light of new evidence;
     d. Students travel back in time to experience the “dawn of microbiology” along with the culture and habits typical of that time.

Reference