

# Pathogen Tracker Game



## NATIONAL SCIENCE EDUCATION STANDARDS AND BENCHMARKS FOR SCIENCE LITERACY CORRELATION

Listed below are Standards and Benchmarks addressed by the Pathogen Tracker Game

### STANDARDS

- Cells carry on the many functions needed to sustain life. They grow and divide, thereby producing more cells. This requires that they take in nutrients, which they use to provide energy for the work that cells do and to make the materials that a cell or an organism needs. C3; 5 - 8
- Disease is a breakdown in structures or functions of an organism. Some diseases are the result of intrinsic failures of the system. Others are the result of damage by infection by other organisms. C 6; 5 - 8
- Hereditary information is contained in genes, located in the chromosomes of each cell. Each gene carries a single unit of information. An inherited trait of an individual can be determined by one or by many genes, and a single gene can influence more than one trait. A human cell contains many thousands of different genes. C 10; 5 - 8
- Cells store and use information to guide their functions. The genetic information stored in DNA is used to direct the synthesis of the thousands of proteins that each cell requires. C 3; 9 - 12
- In all organisms, the instructions for specifying the characteristics of the organism are carried in DNA, a large polymer formed from subunits of four kinds (A, G, C, and T). The chemical and structural properties of DNA explain how the genetic information that underlies heredity is both encoded in genes (as a string of molecular "letters") and replicated (by a templating mechanism). Each DNA molecule in a cell forms a single chromosome. C 7; 9 - 12
- Food provides energy and nutrients for growth and development. Nutrition requirements vary with body weight, age, sex, activity, and body functioning. F 5; 5 - 8
- The severity of disease symptoms is dependent on many factors, such as human resistance and the virulence of the disease-producing organism. Many diseases can be prevented, controlled, or cured. Some diseases, such as cancer, result from specific body dysfunctions and cannot be transmitted. F 2; 9 - 12

Available at: [http://www.nap.edu/openbook.php?record\\_id=4962](http://www.nap.edu/openbook.php?record_id=4962)

**American Association of Family and Consumer Sciences Standards also available at:**  
[http://www.doe.in.gov/octe/facs/NASAFACS/sc\\_1.html](http://www.doe.in.gov/octe/facs/NASAFACS/sc_1.html)

## **BENCHMARKS**

- The information passed from parents to offspring is coded in DNA molecules, long chains linking just four kinds of smaller molecules, whose precise sequence encodes genetic information. 5B/H3
- All living things are composed of cells, from just one to many millions, whose details usually are visible only through a microscope. 5C/M1a
- Before a cell divides, the instructions are duplicated so that each of the two new cells gets all the necessary information for carrying on. 5C/H4c
- Food provides molecules that serve as fuel and building material for all organisms. 5E/M1a
- Viruses, bacteria, fungi, and parasites may infect the human body and interfere with normal body functions. A person can catch a cold many times because there are many varieties of cold viruses that cause similar symptoms. 6E/M3
- Specific kinds of germs cause specific diseases. 6E/M6
- New medical techniques, efficient health care delivery systems, improved diet and sanitation, and a fuller understanding of the nature of health and disease give today's human beings a better chance of staying healthy than their ancestors had. 6E/H3a
- Sanitation measures such as the use of sewers, landfills, isolation, and safe food handling are important in controlling the spread of organisms that cause disease. Improving sanitation to prevent disease has contributed more to saving human life than any advance in medical treatment. 8F/M1
- Many diseases are caused by bacteria or viruses. 8F/M5
- Owing to the large amount of information that computers can process, they are playing an increasingly larger role in medicine. They are used to analyze data and to keep track of and communicate diagnostic information about individuals and statistical information on the distribution and spread of various maladies in populations. 8F/H1
- Biotechnology has contributed to health improvement in many ways, but its cost and application have led to a variety of controversial social and ethical issues. 8F/H7

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