

# Science

## Science Grade 12

### Curriculum Map

Topic A: Living Systems Respond to Their Environment

Resources Included: *Canada in Context*, *CBC News in Review*, *Global Issues in Context*, *Histor!ca*, *The Canadian Encyclopedia*, *Science in Context*

Betty-Lou Ayers

On Behalf of THE ALBERTA LIBRARY

Published December 2015

Updated August 2017

---

## Background and Access Information

Learn Alberta's Online Reference Centre is a \$1.7 million collection of authoritative curricular aligned resources that are licensed on behalf of all students, staff, parents and public librarians learning/teaching/supporting the Alberta curriculum.

To Access the Online Reference Centre:

1. Go to [LearnAlberta.ca](http://LearnAlberta.ca)
2. Select English or French
3. Click on "Online Reference Centre" in the tab along the top of the screen
4. In school while on a school device, users do not need to enter a username or password. Users are able to enter any database or website instantly.
5. Access from a person device in school or remotely from outside of the school will require the user to enter a username/password once to unlock all of the resources.
  - a. School District Username: LA\_\_\_\_\_ Password: \_\_\_\_\_  
(not case sensitive)
6. Please share your district's ORC username/password with your students, parents of your students and fellow staff members. Please do not share the username and password information on an open website (a website that does not require the user to login).

---

## User Guide

### Curricular Topic

|                            |    |
|----------------------------|----|
| I. Focusing Questions..... | 6  |
| II. General Outcomes.....  | 6  |
| III. Key Concepts.....     | 6  |
| IV. General Outcome 1..... | 6  |
| V. General Outcome 2.....  | 9  |
| VI. General Outcome 3..... | 11 |

*(taken from Alberta Education's Program of Studies)*

### Section 1: General References.....14

[Title \(hyperlinked\)](#): ORC Database: Brief Description of what is included.

### Section 2: Reference.....17

["Title." \(hyperlinked\)](#) *Publication*: Author, Publication Date/Info. ORC Database. Date located.

### Section 3: Important People in the Field.....20

["Title." \(hyperlinked\)](#) *Publication*: Author, Publication Date/Info. pg. ORC Database. Date located.

### Section 4: Websites.....20

["Title." \(hyperlinked\)](#) *Publication*: Publication Date/Info. ORC Database. Date

located.

## **Section 5: Videos.....22**

"Title." ([hyperlinked](#)) *Publication:* Publication Date/Info. ORC Database. Date located.

## **Section 6: Primary Sources.....24**

"Title." ([hyperlinked](#)) *Publication:* Publication Date/Info. ORC Database. Date located.

## **Section 7: Articles.....24**

"Title." ([hyperlinked](#)) *Publication:* Publication Date/Info. ORC Database. Date located.

## **Section 8: General References.....25**

[Title \(hyperlinked\)](#): ORC Database: Brief Description of what is included.

## **Section 9: Reference.....26**

"Title." ([hyperlinked](#)) *Publication:* Author, Publication Date/Info. ORC Database. Date located.

## **Section 10: Experiment.....29**

"Title." ([hyperlinked](#)) *Publication:* Author, Publication Date/Info. ORC Database. Date located.

## **Section 11: Websites.....30**

"Title." (hyperlinked) *Publication:* Author, Publication Date/Info. ORC Database. Date located.

## **Section 12: Videos.....32**

"Title." (hyperlinked) *Publication:* Author, Publication Date/Info. ORC Database. Date located.

## **Section 13: Articles.....33**

"Title." (hyperlinked) *Publication:* Author, Publication Date/Info. ORC Database. Date located.

If you have any questions regarding this guide or if you would like a guide for additional grades please contact Bethany Arsenault, ORC Coordinator at [barsenault@thealbertalibrary.ab.ca](mailto:barsenault@thealbertalibrary.ab.ca)

---

## Topic A: Living Systems Respond to Their Environment

---

### Focusing Questions

How do the structure and function of the human circulatory system help to maintain human health? What are the defense mechanisms of the human body? What are the basic principles of Mendelian genetics and how can they be applied to treat genetic diseases? What are the risks, benefits and associated ethical issues of current genetic technology?

**General Outcomes:** There are three major outcomes in this unit.

**Students will:**

- analyze how the human circulatory system facilitates interaction between blood cells and the external environment and investigate cardiovascular health
- analyze the defense mechanisms used by the human body to protect itself from pathogens found in the external environment
- apply the principles of heredity and molecular genetics to explain how human diseases can arise from inherited traits, the risks and benefits of genetic technology, and the need for ethical considerations in the application of scientific knowledge.

**Key Concepts:**

- structure and function of the circulatory system
- composition of human blood tissue and the role of blood
- immune response and defense mechanisms to pathogens
- cardiovascular health
- chromosomal behavior
- principles of Mendelian genetics
- deoxyribonucleic acid DNA and protein synthesis
- mutations and gene therapy

### General Outcome 1

**Students will analyze how the human circulatory system facilitates interaction between blood cells and the external environment and investigate cardiovascular health.**

**Specific Outcomes for Knowledge**

**Students will:**

- describe the principal structures and associated blood vessels of the heart; i.e., ventricles, atria, septum, valves (specific names of valves not required), aorta, vena cavae, pulmonary arteries and veins, coronary arteries
- describe the rhythmic contraction of the heart and its function in the general circulation of blood through pulmonary and systemic pathways
- describe the structure and function of blood vessels and the flow of blood through arteries, arterioles, venules, veins and capillaries
- describe the main components of blood (i.e., plasma, red blood cells, white blood cells, platelets, blood proteins that include antibodies, hemoglobin and hormones) and their role in the transportation of substances (e.g., nutrients, wastes, gases, hormones), blood clotting, the defence against pathogens and the distribution of thermal energy.

### Specific Outcomes for Science, Technology and Society (STS) (Social and Environmental Contexts Emphasis)

**Students will:** describe how society provides direction for scientific and technological development

- *investigate and explain the relationship between exercise, lifestyle, diet, gender and cardiovascular health by examining blood pressure, heart rate and cholesterol levels.*

### Specific Outcomes for Skills (Nature of Science Emphasis)

#### Initiating and Planning

**Students will:** formulate questions about observed relationships and plan investigations of questions, ideas, problems and issues

- design an experiment to determine the effects of exercise, emotion, gender or chemicals such as caffeine on blood pressure and heart rate

#### Performing and Recording

**Students will:** conduct investigations into relationships among observable variables and use a broad range of tools and techniques to gather and record data and information

- measure resting heart rate and blood pressure and determine the effects of exercise on both factors

- observe prepared slides or electronic images of human blood
- *perform a heart dissection to identify the major parts and to determine the directional flow of blood through the organ*
- *use computer software or video programs to view the mechanics of heart function and associated blood flow including the functioning of the valves that control venous blood flow*

### **Analyzing and Interpreting**

**Students will:** analyze data and apply mathematical and conceptual models to develop and assess possible solutions

- map blood flow through a mammalian heart
- *research and plot the relationship between heart rate and the size of an organism*
- *evaluate the validity of the hypothesis that blood flow can be explained on the basis of tidal forces*
- *extrapolate the number of heartbeats per year, or the volume of blood circulated in a year, based on their resting heart rate*
- *compare a healthy person, an athlete and a person with cardiac disease in terms of oxygen demand, cardiac output and vessel blockage, using a simulation*

### **Communication and Teamwork**

**Students will:** work collaboratively in addressing problems and apply the skills and conventions of science in communicating information and ideas and in assessing results

- use appropriate Système international (SI) units, fundamental and derived units and significant digits
- use appropriate numeric, symbolic, graphical and linguistic modes of representation to communicate ideas, plans and results
- *select and use multimedia capabilities to present findings on the influential role of various factors such as lifestyle and genetics on blood pressure*



## General Outcome 2

**Students will analyze the defense mechanisms used by the human body to protect itself from pathogens found in the external environment.**

### Specific Outcomes for Knowledge

**Students will:**

- describe how pathogens in the environment (*e.g., mosquito-borne parasites, bacteria, viruses*) enter the circulatory system and may have an adverse affect on health
- describe, in general terms, the function of various body mechanisms, including the skin and body secretions (*i.e., tears and stomach acid*), in preventing pathogens from entering body tissues
- describe, in general terms, how immunity to pathogens develops, how the immune system responds to a foreign antigen and the roles of macrophages, B cells, helper T cells, killer T cells, suppressor T cells, memory cells and antibodies
- explain the interrelationship of autoimmune diseases and the human immune system; *e.g., multiple sclerosis, arthritis, lupus*
- analyze how vaccines defend against disease-causing bacteria and viruses.

### Specific Outcomes for Science, Technology and Society (STS) (Social and Environmental Contexts Emphasis)

**Students will:**

- describe how society provides direction for scientific and technological development
- *describe how vaccination programs are beneficial in controlling epidemics or dealing with concerns about the spread of possible infection, such as tetanus, smallpox and influenza*
- *describe how improvements to sanitation, personal hygiene and the availability of potable water have greatly reduced the incidence of communicable diseases and discuss the ongoing need for vigilance and research into modes of transmission of such diseases as typhoid, cholera and gastrointestinal diseases.*

## Specific Outcomes for Skills (Nature of Science Emphasis)

### Initiating and Planning

**Students will:** formulate questions about observed relationships and plan investigations of questions, ideas, problems and issues

- *select appropriate procedures and instruments to investigate the various ways the human body protects itself from diseases*
- *design a study to test the effectiveness of a drug, incorporating the use of a placebo into a double-blind study*

### Performing and Recording

**Students will:** conduct investigations into relationships among observable variables and use a broad range of tools and techniques to gather and record data and information

- *conduct research and synthesize information on the various ways the human body protects itself from diseases*
- *perform a biogeographical study to compare the incidence of disease, such as West Nile encephalitis, Ebola hemorrhagic fever or leprosy (Hansen's disease), in different regions of the world*
- *simulate an immune response, using a model and/or computer simulation*

### Analyzing and Interpreting

**Students will:** analyze data and apply mathematical and conceptual models to develop and assess possible solutions

- *evaluate research on the development of a vaccine for the human immunodeficiency virus (HIV)*
- *evaluate the use of anecdotal versus statistical evidence in validating a scientific interpretation or conclusion*
- *evaluate implications of findings to questions, such as why some individuals choose not to be vaccinated or why the incidence of tuberculosis is rising*
- *assess both ethical and practical implications of using animals to test a drug or treatment intended for human application*

### Communication and Teamwork

**Students will:** work collaboratively in addressing problems and apply the skills and conventions of science in communicating information and ideas and in assessing results

- *select and use multimedia capabilities to present findings on the effectiveness of vaccination on specific forms of disease, such as tuberculosis*

## General Outcome 3

***Students will apply the principles of heredity and molecular genetics to explain how human diseases can arise from inherited traits, the risks and benefits of genetic technology, and the need for ethical considerations in the application of scientific knowledge.***

### Specific Outcomes for Knowledge

***Students will:***

- describe, in general, the behaviour of chromosomes during mitosis, meiosis and fertilization
- explain, with the aid of Punnett squares, the inheritance of single traits by applying current understanding of the gene, segregation and dominance
- distinguish autosomal from sex-linked patterns of inheritance
- describe the structure of DNA by:
  - identifying the structure of DNA as a double helix
  - listing the essential components of DNA as nucleotides
  - identifying the base pairings between the strands of the double helix
  - explain the general process of DNA replication
- describe a primary function of DNA by describing how an amino acid sequence of a polypeptide (protein) is determined by the sequence of DNA triplet codes, i.e., use of a table of DNA triplets matched with amino acids
- describe the role of proteins in the human body as regulatory molecules (enzymes), as structural molecules and as a source of energy
- describe how mutations in DNA affect the proteins produced resulting in human diseases; *e.g., sickle-cell anemia, hemophilia, Huntington's disease, cystic fibrosis*
- describe, in general terms, genetic engineering and its application to gene therapy and the development of genetically modified organisms
- describe the development of resistance in bacteria and viruses, based on the concepts of mutation, plasmid transfer, transformation and natural selection.

## Specific Outcomes for Science, Technology and Society (STS) (Social and Environmental Contexts Emphasis)

**Students will:** explain that science and technology are developed to meet societal needs and expand human capability

- *explore the potential medical and ethical implications of the Human Genome project and other genome sequencing projects on society*
- *trace the development of plant and animal breeding techniques, starting with traditional practices (e.g., Hopi/Huron/Iroquois maize breeding), to Mendel's work on inheritance, to the contributions of many scientists on the discovery of the molecular structure of DNA and the development of recombinant DNA technology*

explain that decisions regarding the application of scientific and technological development involve a variety of perspectives, including social, cultural, environmental, ethical and economic considerations

- *assess the risks and benefits of genetic technology and the need for ethical considerations; e.g., stem-cell research, access to genetic screening, genetically modified organisms.*

## Specific Outcomes for Skills (Nature of Science Emphasis)

### Initiating and Planning

**Students will:** formulate questions about observed relationships and plan investigations of questions, ideas, problems and issues

- *make predictions about the probability of inheriting specific traits*
- *define a testable question that would show environmental influences on diseases, such as type 2 diabetes, in different populations*
- *devise an experimental procedure to investigate a characteristic of an organism acquired through genetic engineering, such as genetically modified canola, corn or soybean*

### Performing and Recording

**Students will:** conduct investigations into relationships among observable variables and use a broad range of tools and techniques to gather and record data and information

- *investigate, with the aid of a pedigree chart, the familial inheritance of a specific trait that is controlled by a single pair of genes*
- *collect data on the frequency of hereditary diseases such as*

*sickle cell anemia or Tay-Sachs disease in different populations of people*

- *research, integrate and synthesize information on the relationship between mutagens found in the environment and the rate of mutation*
- *research the relationship between the virulence of a pathogen and the degree of genetic heterogeneity within a population, such as the impact of disease introduced by Europeans to Indigenous North American peoples*
- *simulate the production of proteins, using models*

### **Analyzing and Interpreting**

**Students will:** analyze data and apply mathematical and conceptual models to develop and assess possible solutions

- *interpret patterns and trends in data associated with autosomal and sex-linked inheritance*
- *predict, quantitatively, the probability of acquiring a particular trait in autosomal and sex-linked patterns of inheritance*
- *identify and evaluate potential applications of genetic engineering to health and agriculture*
- *research and evaluate the long-term effect of the use of antibacterial soaps and antibiotics on bacterial populations*

### **Communication and Teamwork**

**Students will:** work collaboratively in addressing problems and apply the skills and conventions of science in communicating information and ideas and in assessing results

- *work cooperatively to investigate the inheritance of a human trait that is controlled by a single pair of genes, such as tongue rolling, attached earlobes*
- *research, present and defend a position on genetically modified organisms*

## Section 1: General Reference

---

[Antimicrobial Resistance](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Bioethics](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Biotechnology](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Blood Groups](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Cell Division](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Chromosomes](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Circulatory System](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[DNA](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Ebola and Other Hemorrhagic Fevers](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Emerging Infectious Diseases](#): *Global Issues in Context*. Topic/definition page contains links to Global Viewpoints, podcasts, primary source materials, websites, reference, videos, images and academic journals.

[Gene Therapy](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Genetic Disorders](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Genetic Engineering](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Genetically Modified Organisms](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Genetic Disorders](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Genetics](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Globalization and Infectious Disease](#): *Global Issues in Context*. Topic/definition page contains links to Global Viewpoints, podcasts, primary source materials, websites, reference, videos, images and academic journals.

[H1N1 \(Swine\) Flu](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Heart](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Heart Disease](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Heart Disease](#): *Global Issues in Context*. Topic/definition page contains links to Global Viewpoints, podcasts, primary source materials, websites, reference, and academic journals.

[Hemophilia](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[HIV/AIDS](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Human Genome](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Huntington Disease](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Hypertension](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Immune System](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Infectious Diseases](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Stem Cells and Stem Cell Research](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Tuberculosis](#): *Global Issues in Context*. Topic/definition page contains links to Global Viewpoints, podcasts, primary source materials, websites, reference, videos, images and academic journals.

[Vaccine](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Vaccines](#): *Global Issues in Context*. Topic/definition page contains links to Global Viewpoints, podcasts, primary source materials, websites, reference, videos, images and academic journals.



[Viruses](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Waterborne Disease](#): *Global Issues in Context*. Topic/definition page contains links to *Global Viewpoints*, podcasts, primary source materials, websites, reference, and academic journals.

[West Nile Virus Infection](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

## Section 2: Reference

---

"[Antibody and antigen](#)." *World of Scientific Discovery*. Gale, 2012. *Science in Context*. Web. 2 Sept. 2015.

**Image:** "[Antibody blocks cell's access to growth factors](#)." *World of Genetics*. Gale, 2007. *Science in Context*. Web. 2 Sept. 2015.

**Image:** "[Epidermis](#)." *UXL Encyclopedia of Science*. Ed. Amy Hackney Blackwell and Elizabeth Manar. 3rd ed. Farmington Hills, MI: UXL, 2015. *Science in Context*. Web. 2 Sept. 2015.

"[Aorta](#)." *World of Biology*. Gale, 2006. *Science in Context*. Web. 31 Aug. 2015.

"[Arteries](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 31 Aug. 2015.

"[Autoimmune disease](#)." *World of Biology*. Gale, 2006. *Science in Context*. Web. 2 Sept. 2015.

"[Blood circulation](#)." *World of Scientific Discovery*. Gale, 2007. *Science in Context*. Web. 31 Aug. 2015.

"[Blood-Clotting Factors](#)." *Biotechnology: Changing Life Through Science*. Detroit: UXL, 2012. *Science in Context*. Web. 31 Aug. 2015.

"[Blood coagulation and blood coagulation tests](#)." *World of Anatomy and Physiology*. Gale, 2007. *Science in Context*. Web. 31 Aug. 2015.

**Image:** "[Blood Vessels](#)." *Gale Science in Context*. Detroit: Gale, 2010. *Science in Context*. Web. 31 Aug. 2015.

"[Capillaries](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 31 Aug. 2015.

"[Cardiac cycle](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 31 Aug. 2015.

"[Cardiovascular Diseases](#)." *Biology*. Ed. Richard Robinson. New York: Macmillan Reference USA, 2009. *Science in Context*. Web. 31 Aug. 2015.

"[Cholera](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 2 Sept. 2015.

"[Circulatory system](#)." *World of Anatomy and Physiology*. Gale, 2002. *Science in Context*. Web. 31 Aug. 2015.

*Image:* "Circulatory system." *World of Anatomy and Physiology*. Gale, 2002. *Science in Context*. Web. 31 Aug. 2015.

"[Enterobacteria](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 2 Sept. 2015.

"[Heart](#)." *UXL Encyclopedia of Science*. Ed. Amy Hackney Blackwell and Elizabeth Manar. 3rd ed. Farmington Hills, MI: UXL, 2015. *Science in Context*. Web. 31 Aug. 2015.

"[Heart and Circulation](#)." *Biology*. Ed. Richard Robinson. New York: Macmillan Reference USA, 2009. *Science in Context*. Web. 31 Aug. 2015.

"[Heart defects](#)." *World of Anatomy and Physiology*. Gale, 2007. *Science in Context*. Web. 2 Sept. 2015.

"[Heart disease](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 2 Sept. 2015.

"[High-density lipoproteins \(HDL\)](#)." *The Gale Encyclopedia of Medicine*. Ed. Jacqueline L. Longe. 5th ed. Farmington Hills, MI: Gale, 2015. *Science in Context*. Web. 2 Sept. 2015.

"[Immune system](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 2 Sept. 2015.

"[Immunization](#)." *UXL Complete Life Science Resource*. Ed. Julie Carnagie and Leonard C. Bruno. Detroit: UXL, 2009. *Science in Context*. Web. 2 Sept. 2015.

"[Leprosy](#)." *The Gale Encyclopedia of Medicine*. Ed. Jacqueline L. Longe. 5th ed. Farmington Hills, MI: Gale, 2015. *Science in Context*. Web. 4 Sept. 2015.

"[Leprosy](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 4 Sept. 2015.

"[Leprosy](#)." *Science and Its Times*. Ed. Neil Schlager and Josh Lauer. Vol. 2. Detroit: Gale, 2001. *Science in Context*. Web. 4 Sept. 2015.

"[Microbial flora of the stomach and gastrointestinal tract](#)." *World of Microbiology and Immunology*. Ed. Brenda Wilmoth Lerner and K. Lee Lerner. Detroit: Gale, 2007. *Science in Context*. Web. 2 Sept. 2015.

"[Mucus](#)." *World of Anatomy and Physiology*. Gale, 2007. *Science in Context*. Web. 2 Sept. 2015.

"[Pathogens](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 2 Sept. 2015.

"[T cells](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 2 Sept. 2015.

"[Typhoid fever](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 2 Sept. 2015.

"[Typhoid fever](#)." *World of Health*. Gale, 2007. *Science in Context*. Web. 2 Sept. 2015.

**Image:** "[Cross-section of the skin](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 2 Sept. 2015.

"[Veins](#)." *World of Biology*. Gale, 2006. *Science in Context*. Web. 31 Aug. 2015.

"[Water Quality](#)." *Earth Sciences for Students*. Detroit: Macmillan Reference USA, 2008. *Science in Context*. Web. 2 Sept. 2015.

[Water treatment](#)." *Environmental Encyclopedia*. Gale, 2011. *Science in Context*. Web. 2 Sept. 2015.

### Section 3: Important People in the Field

---

[William Harvey](#). *Science in Context*. Biography/Content page contains links to featured content, reference, biographies, images, and academic journals.

### Section 4: Websites

---

[Centers for Disease Control and Prevention, Special Pathogens Branch. "Disease Information."](#) *Science in Context*. Web. 2 Sept. 2015.

"[Centers for Disease Control and Prevention. Tuberculosis.](#)" *Gale Science in Context*. Detroit: Gale, 2015. *Science in Context*. Web. 4 Sept. 2015. The CDC Tuberculosis website provides a plethora of medical, public policy, and education-related information on tuberculosis (TB).

"[Combination Vaccines and the Immune System.](#)" *Centers for Disease Control and Prevention (CDC)*. *Science in Context*. Web. 2 Sept. 2015.

[Cholera](#). *Pan American Health Organization*. *Science in Context*. Web. 2 Sept. 2015.

[Heart Disease/Heart Health](#). *Government of Canada*. *Science in Context*. Web. 2 Sept. 2015.

"Immune System and Disorders." *National Institutes of Health (NIH)*. *Science in Context*. Web. 2 Sept. 2015.

[UNAIDS The Joint Programme on HIV/AIDS](#). *United Nations*. *World Book Advanced*. Web. 2 Sept. 2015.

"[Vaccines.](#)" *Bill and Melinda Gates Foundation*. *Global Issues in Context*. Web. 2 Sept. 2015.

"[Virtual Cardiology Lab.](#)" *Gale Science in Context*. Detroit: Gale, 2010. *Science in Context*. Web. 2 Sept. 2015.

"[Water, Sanitation & Hygiene.](#)" *Bill and Melinda Gates Foundation*. *Global Issues in Context*. Web. 2 Sept. 2015.

"[What is Hemophilia?](#)" *Canadian Hemophilia Society*. *Science in Context*, 2012. Web. 31 Aug. 2015.

[WHO: Cholera](#). World Health Organization. [Science in Context](#). Web. 2 Sept. 2015.

[WHO: Typhoid Fever](#). World Health Organization. [Science in Context](#). Web. 2 Sept. 2015.

[WHO: Water](#). World Health Organization. [Science in Context](#). Web. 2 Sept. 2015.

## Section 5: Videos

---

"[Blood Pressure Fluctuations](#)." 2015. *Global Issues In Context*. Web. 4 Sept. 2015. Blood pressure fluctuations linked to increased risk for heart disease, new study finds.

"[Chocolate and Cardiovascular Disease](#)." 2015. *Global Issues In Context*. Web. 4 Sept. 2015. Can a heart-healthy eating plan include a daily dose of chocolate?

"[Cholesterol and Heart Disease](#)." 2015. *Global Issues In Context*. Web. 2 Sept. 2015. Elevated cholesterol levels in young adulthood may significantly increase risk for heart disease, study finds.

"[Circulatory System and the Heart](#)." *Khan Academy* 1 June 2012. *Science in Context*. Web. 31 Aug. 2015.

"[Combined four-drug fixed-dose regimen effective for treating TB](#)." *Reuters Health - The Doctor's Channel Daily Newscast* 2011. *Science in Context*. Web. 4 Sept. 2015. Outcomes among tuberculosis patients treated with a fixed-dose combination of four drugs are similar to those in patients treated with the same four drugs given separately.

"[Debi's Story](#)." *Gale Science in Context*. Detroit: Gale, 2011. *Science in Context*. Web. 4 Sept. 2015. Four videos following a young girl's infection with tuberculosis.

"[Ebola: A Deadly Virus Outbreak](#)." *CBC News in Review*, Dec. 2014. Web. 8 Sept. 2015. CBC report takes a look at how Ebola has become a world wide problem. Teaching guide accompanies video.

"[The Firefighter's Workout](#)." 2015. *Global Issues In Context*. Web. 4 Sept. 2015. A workout designed to help firefighters stay heart-healthy focuses on functional fitness exercises like stair climbing. Here's how members of the New Brunswick, N.J. fire department stay fit.

"[Flu Season: Winter's Nasty Blow](#)." *CBC News in Review*, Mar. 2013. Web. 8 Sept. 2015. CBC report looks at the frequency and severity of the flu that spread across Canada and the United States in the winter of 2012/2013 as well as flu vaccine effectiveness. Teaching guide accompanies video.



"[Hunting the Nightmare Bacteria](#)." Frontline 2013. *Science in Context*. Web. 4 Sept. 2015. In-depth report on the wave of anti-biotic resistant bacteria infections and what today's scientists are doing to combat them.

"[Mumbai Confronts Drug-Resistant Tuberculosis Strain](#)." *Worldfocus* 2009. *Science in Context*. Web. 4 Sept. 2015. An in-depth look into a drug-resistant strain of tuberculosis that has become an epidemic in Mumbai, India. Many of those infected cannot afford the cost of proper treatment and risk death or infecting others they come into contact with.

"[Obesity and Mortality](#)." 2014. *Global Issues in Context*. Web. 4 Sept. 2015. People who are extremely obese have higher rates of mortality from heart disease, cancer and diabetes, study finds.

"[Physical Activity Frequency & Health](#).(Video file)." 2015. *Global Issues in Context*. Web. 4 Sept. 2015. How often do you have to exercise to really lower your risk of heart disease and stroke?

"[Smoking Exposure and Your Child's Heart Health](#).(Video file)." 2015. *Global Issues in Context*. Web. 4 Sept. 2015. Does exposure to second-hand smoke increase a child's risk for cardiovascular disease?

"[Stigma Stalks India's Leprosy Sufferers as Disease Returns](#)." *AFP/Getty Images* 1 Apr. 2015. *Global Issues in Context*. Web. 4 Sept. 2015. Reports on the comeback of leprosy in some parts of India, despite the fact that the Indian government declared victory over leprosy in 2005 and there are more than a hundred thousand lepers still living in colonies and shunned from society.

\*"[TB Silent Killer](#)." *Frontline* 2014. *Science in Context*. Web. 4 Sept. 2015. Frontline investigates the increasingly virulent strains of TB that have spread around the world, yet in many countries health workers continue to rely on a test first developed in the 1800s.

\*Not licensing for viewing in Alberta...yet.

"[Vaccines: Pass or Fail?](#) *CBC News in Review*. Mar. 2015. Web. 8 Sept. 2015. CBC report examines both sides of the debate over vaccination. Teaching guide accompanies video.

"[Vegetarian Benefits](#)." 2015. *Global Issues in Context*. Web. 4 Sept. 2015. Eating a pro-vegetarian diet may lower your risk of dying from heart disease and stroke by up to 20 percent.

"[Workout Intensity and Your Health](#)." 2015. *Global Issues In Context*. Web. 4 Sept. 2015. Low intensity or high intensity: What type of workout is better if you're at risk for diabetes or heart disease?

## Section 6: Primary Sources

---

### Podcast:

[Author Recounts His 'Journey With Leprosy'.](#) *Weekend All Things Considered* 1 Feb. 2009. *Global Issues In Context*. Web. 4 Sept. 2015.

## Section 7: Articles

---

["Review of hormone aberrations in rheumatoid arthritis and systemic lupus erythematosus: testing and treatment suggestions."](#) *Townsend Letter* June 2015: 45+. *Science in Context*. Web. 4 Sept. 2015.

["U.S. Treating Visitor From India for Drug-Resistant TB."](#) *New York Times* 10 June 2015: A3(L). *Science in Context*. Web. 4 Sept. 2015.

### General Outcome 3: Heredity and Genetics

**Students will apply the principles of heredity and molecular genetics to explain how human diseases can arise from inherited traits, the risks and benefits of genetic technology, and the need for ethical considerations in the application of scientific knowledge.**

#### Section 8: General Reference

---

[Antimicrobial Resistance](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Chromosomes](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Cystic Fibrosis](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[DNA](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Francis Crick](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Genetic Disorders](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Genetic Engineering](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Genetically Modified Foods](#): *Global Issues in Context*. Topic/definition page contains links to Global Viewpoints, podcasts, primary source materials, websites, reference, videos, images and academic journals.

[Human Genome](#): Topic/definition page contains links to featured content,

reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Stem Cells and Stem Cell Research](#): Topic/definition page contains links to featured content, reference, biographies, images, news, videos, academic journals, magazine articles, and websites.

[Tuberculosis](#): *Global Issues in Context*. Topic/definition page contains links to Global Viewpoints, podcasts, primary source materials, websites, reference, videos, images and academic journals.

## Section 9: Reference

---

"[Antibiotic resistance](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 4 Sept. 2015.

"[Chromosomal abnormalities](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 4 Sept. 2015.

"[Chromosomes, eukaryotic](#)." *World of Microbiology and Immunology*. Ed. Brenda Wilmoth Lerner and K. Lee Lerner. Detroit: Gale, 2003. *Science in Context*. Web. 4 Sept. 2015.

"[Cystic fibrosis](#)." *The Gale Encyclopedia of Medicine*. Ed. Jacqueline L. Longe. 5th ed. Farmington Hills, MI: Gale, 2015. *Science in Context*. Web. 2 Sept. 2015.

"[Cystic Fibrosis](#)." *Genetics*. Ed. Richard Robinson. New York: Macmillan Reference USA, 2008. *Science in Context*. Web. 8 Sept. 2015.

"[Denaturing gradient gel electrophoresis](#)." *World of Genetics*. Gale, 2007. *Science in Context*. Web. 8 Sept. 2015.

"[The Discovery of Genetic Markers for Disease](#)." *Science and Its Times*. Ed. Neil Schlager and Josh Lauer. Vol. 7. Detroit: Gale, 2001. *Science in Context*. Web. 4 Sept. 2015.

"[DNA \(deoxyribonucleic acid\)](#)." *World of Biology*. Gale, 2006. *Science in Context*. Web. 4 Sept. 2015.

**Image:** "[Structure of DNA molecule](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 4 Sept. 2015.

**Image:** "[Microinjection of a Gene](#)." *Gale Science in Context*. Detroit: Gale, 2010. *Science in Context*. Web. 8 Sept. 2015.

"[Double Helix](#)." *UXL Complete Life Science Resource*. Ed. Julie Carnagie and Leonard C. Bruno. Detroit: UXL, 2009. *Science in Context*. Web. 4 Sept. 2015.

"[Francis Crick](#)." *World of Chemistry*. Gale, 2006. *Science in Context*. Web. 4 Sept. 2015.

*Image*: "[Gene mutation and cystic fibrosis](#)." *Genetics*. Ed. Richard Robinson. New York: Macmillan Reference USA, 2008. *Science in Context*. Web. 8 Sept. 2015.

"[Genetic Engineering](#)". The Canadian Encyclopedia. Toronto: Historica Canada, 2009. Web. 23 Feb 2009.

"[Genetic engineering](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 4 Sept. 2015.

"[Genetic Testing, Medical](#)." *Biotechnology: Changing Life Through Science*. Detroit: UXL, 2012. *Science in Context*. Web. 4 Sept. 2015.

"[Genetically Modified Food Debate](#)". The Canadian Encyclopedia. Toronto: Historica Canada, 2003. Web. 9 Sept. 2015.

"[Genetically Modified Foods](#)". The Canadian Encyclopedia. Toronto: Historica Canada, 2013. Web. 9 Sept. 2015.

"[Genetically modified foods and organisms](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Canada in Context*. Web. 8 Sept. 2015.

"[Genetically Modified Organism \(GMO\)](#)." *UXL Encyclopedia of Science*. Ed. Amy Hackney Blackwell and Elizabeth Manar. 3rd ed. Farmington Hills, MI: UXL, 2015. *Science in Context*. Web. 4 Sept. 2015.

"[Genome](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 4 Sept. 2015.

"[George Sumner Huntington](#)." *World of Health*. Gale, 2007. *Science in Context*. Web. 4 Sept. 2015.

"[Human Genome Project](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 4 Sept. 2015.

"[Human Embryonic Stem Cell Debate](#)." *Biotechnology: In Context*. Ed. Brenda Wilmoth Lerner and K. Lee Lerner. Detroit: Gale, 2012. In Context Series. *Science in Context*. Web. 4 Sept. 2015.

"[Huntington disease](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 4 Sept. 2015.

"[Huntington disease](#)." *World of Genetics*. Gale, 2007. *Science in Context*. Web. 4 Sept. 2015.

"[Medical genetics](#)." *The Gale Encyclopedia of Science*. Ed. K. Lee Lerner and Brenda Wilmoth Lerner. 5th ed. Farmington Hills, MI: Gale, 2014. *Science in Context*. Web. 4 Sept. 2015.

"[Newborn genetic screening](#)." *World of Genetics*. Gale, 2007. *Science in Context*. Web. 4 Sept. 2015.

"[Population genetics](#)." *World of Biology*. Gale, 2006. *Science in Context*. Web. 8 Sept. 2015.

"[Punnett Square](#)." *UXL Complete Life Science Resource*. Ed. Julie Carnagie and Leonard C. Bruno. Detroit: UXL, 2011. *Science in Context*. Web. 4 Sept. 2015.

"[Punnett square](#)." *World of Genetics*. Gale, 2007. *Science in Context*. Web. 4 Sept. 2015.

"[Replication](#)." *Biotechnology: In Context*. Ed. Brenda Wilmoth Lerner and K. Lee Lerner. Detroit: Gale, 2012. In Context Series. *Science in Context*. Web. 4 Sept. 2015.

"[Sex-linked traits](#)." *World of Biology*. Gale, 2006. *Science in Context*. Web. 4 Sept. 2015.

"[Sickle cell anemia](#)." *World of Genetics*. Gale, 2007. *Science in Context*. Web. 4 Sept. 2015.

"[Stem Cell Research](#)". The Canadian Encyclopedia. Toronto: Historica Canada, 2009. Web. 9 Sept 2015.

"[Stem Cells](#)." *Biotechnology: In Context*. Ed. Brenda Wilmoth Lerner and K. Lee Lerner. Detroit: Gale, 2012. In Context Series. *Science in Context*. Web. 4 Sept. 2015.



"[Stem Cells](#)." *Opposing Viewpoints Online Collection*. Detroit: Gale, 2015. *Science in Context*. Web. 4 Sept. 2015.

"[Stem Cells, Embryonic](#)." *Biotechnology: In Context*. Ed. Brenda Wilmoth Lerner and K. Lee Lerner. Detroit: Gale, 2012. In Context Series. *Science in Context*. Web. 4 Sept. 2015.

"[Stem Cell Lines](#)." *Biotechnology: Changing Life Through Science*. Detroit: UXL, 2012. *Science in Context*. Web. 4 Sept. 2015.

"[Tay-Sachs Disease](#)." *World of Genetics*. Gale, 2007. *Science in Context*. Web. 4 Sept. 2015.

"[Tuberculosis](#)". The Canadian Encyclopedia. Toronto: Historica Canada, 2008. Web. 8 May 2008.

"[Tuberculosis](#)." *The Gale Encyclopedia of Environmental Health*. Ed. Jacqueline Longe. Vol. 2. Detroit: Gale, 2013. 752-761. *Global Issues In Context*. Web. 8 Sept. 2015.

## Section 10: Experiment

---

"[Genetics](#)." *Experiment Central: Understanding Scientific Principles Through Projects*. M. Rae Nelson. Ed. Kristine Krapp. 2nd ed. Detroit: UXL, 2010. *Science in Context*. Web. 4 Sept. 2015.

## Section 11: Websites

---

"[About CF](#)." *Cystic Fibrosis Canada. The Canadian Encyclopedia*. Toronto: Historica Canada, 2009. Web 9 Sept. 2015.

"[Biotechnology](#)." *BIOTECCanada. The Canadian Encyclopedia*. Toronto: Historica Canada, 2009. Web 9 Sept. 2015. Provides a basic overview of Canadian biotechnology research projects and industrial applications.

"[Lung Health](#)." *Canadian Lung Association. The Canadian Encyclopedia*. Toronto: Historica Canada, 2009. Web 9 Sept. 2015. Provides a reliable source of current information about diseases related to lung health.

Centers for Disease Control and Prevention (CDC). "[Antibiotic and Antimicrobial Resistance](#)." *Gale Science in Context*. Detroit: Gale, 2015. *Science in Context*. Web. 4 Sept. 2015.

"[Centers for Disease Control and Prevention, Division of Vector-Borne Infectious Diseases, West Nile Virus](#)" *Gale Science in Context*. Detroit: Gale, 2015. *Science in Context*. Web. 4 Sept. 2015.

"[Cloning/Embryonic Stem Cells](#)." *National Human Genome Research Institute*, April 2006. *Science in Context*. Web. 4 Sept. 2015.

"[Cystic Fibrosis](#)." Medline Plus. U.S. National Library of Medicine. *Science in Context*. Web. 2 Sept. 2015.

"[Drug resistance](#)." WHO Programs and Projects. World Health Organization (WHO). *Gale Science in Context*. Detroit: Gale, 2015. *Science in Context*. Web. 4 Sept. 2015.

"[Food, Genetically Modified](#)." WHO Health. *Gale Science in Context*. Detroit: Gale, 2015. *Science in Context*. Web. 4 Sept. 2015.

"[Geneskool: Inspiring Society's Future Scientists](#)." *Genome BritishColumbia. The Canadian Encyclopedia*. Toronto: Historica Canada, 2009. Web 9 Sept. 2015. Genome BC is committed to providing curious minds with unbiased and up-to-date information about the rapidly changing field of genomics; its relevance to society, the benefits and risks of genomics research, and the impact it's having on our health, our environment, our food supply and our energy sources.

"[The Global Fund to Fight AIDS, Tuberculosis and Malaria](#)." *Global Issues in Context*. Web. 2 Sept. 2015.

[Human Genome Project](#). U.S. Department of Energy. [Global Issues in Context](#). Web. 2 Sept. 2015.

"[Human Genome Project Information](#)." Department of Energy (DOE). [Science in Context](#). Web. 2 Sept. 2015.

"[Learn about HD](#)." Huntington Society of Canada. *The Canadian Encyclopedia*. Toronto: Historica Canada, 2009. Web 9 Sept. 2015.

"[Michael Smith: Nobel Prize Winner](#)." *Science.ca*. GCS Research Society, B.C. *The Canadian Encyclopedia*. Toronto: Historica Canada, 2009. Web 9 Sept. 2015.

"[National Tay-Sachs and Allied Diseases Association](#)." *Gale Science in Context*. Detroit: Gale, 2015. *Science in Context*. Web. 8 Sept. 2015.

"[The Stem Cell Divide](#)." National Geographic Society. *Science in Context*. Web. 4 Sept. 2015.

"[Stem Cell Registry](#)." National Institutes of Health (NIH). *Science in Context*. Web. 4 Sept. 2015.

"[The Stop TB Partnership](#)." [Global Issues in Context](#). Web. 2 Sept. 2015.

"[Tuberculosis](#)." European Centre for Disease Prevention and Control (ECDC). [Global Issues in Context](#). Web. 2 Sept. 2015.

"[Stem Cell Quick Reference](#)." The University of Utah (NIH). Genetics Science Learning Center. *Science in Context*. Web. 4 Sept. 2015.

"[Watson and Crick Describe the Structure of DNA](#). PBS." *Gale Science in Context*. Detroit: Gale, 2015. *Science in Context*. Web. 4 Sept. 2015.

## Section 12: Videos

---

"[The Burden of Knowing](#)." *NOVA* 2015. *Science in Context*. Web. 4 Sept. 2015. Discuss how genetic tests reveal important information that could help save lives, but at the same time come with a cost.

"[Eric Lander](#)." *New York Times*. 2012. *Global Issues In Context*. Web. 8 Sept. 2015. An interview with the mathematician and geneticist behind the Human Genome Project and the Broad Institute.

"[Fewer Babies with Genetic Defects Being Born](#)." *AP Video News* 2010. *Science in Context*. Web. 4 Sept. 2015.

"[Genetics 101 Part 1: What are Genes?](#)" *Khan Academy* 1 June 2012. *Science in Context*. Web. 8 Sept. 2015.

"[Genetics 101 Part 2: What are SNPs?](#)" *Khan Academy* 1 June 2012. *Science in Context*. Web. 8 Sept. 2015.

"[Hunting the Nightmare Bacteria](#)." *Frontline* 22 Oct. 2013. *Global Issues In Context*. Web. 2 Sept. 2015. In-depth report on the wave of anti-biotic resistant bacteria infections and what today's scientists are doing to combat them.

"[Introduction to DNA](#)." *Khan Academy* 1 June 2012. *Science in Context*. Web. 4 Sept. 2015.

"[Introduction to Heredity](#)." *Khan Academy* 1 June 2012. *Science in Context*. Web. 4 Sept. 2015. Heredity and classical genetics, dominant and recessive traits, and heterozygous and homozygous genotypes are discussed.

"[Mumbai Confronts Drug-Resistant Tuberculosis Strain](#)." *WorldFocus* 2 Sept. 2009. *Global Issues In Context*. Web. 2 Sept. 2015. An in-depth look into a drug-resistant strain of tuberculosis that has become an epidemic in Mumbai, India. Many of those infected cannot afford the cost of proper treatment and risk death or infecting others they come into contact with.

"[My Father, My Brother, and Me: The Stem Cell Controversy](#)." *Frontline* 2009. *Science in Context*. Web. 4 Sept. 2015. Cells from embryos, not fetal tissue, hold new possibilities for a cure, but a debate erupts over the ethics and morality of using them.

"[Personal Genome Project](#)." *NOVA* 2008. *Global Issues in Context*. Web. 8 Sept. 2015. The Personal Genome Project, spearheaded by George Church of Harvard's Center for Computational Genetics, aims to recruit 100,000 people willing to offer up their DNA and personal life histories. It's all in an effort to further knowledge of human genetics and why we get—or don't get—diseases.

["Possibilities of Genetic Engineering."](#) *Gale Video Series* 2015. *Science in Context*. Web. 4 Sept. 2015.

["Stem Cells and Disease Research."](#) *NOVA* 2013. *Science in Context*. Web. 4 Sept. 2015.

["TB Silent Killer."](#) *Frontline* 25 Mar. 2014. *Global Issues in Context*. Web. 2 Sept. 2015. Frontline investigates the increasingly virulent strains of TB that have spread around the world, yet in many countries health workers continue to rely on a test first developed in the 1800s.

["Uganda: The Condom Controversy."](#) *Frontline: World* 13 July 2007. *Global Issues in Context*. Web. 2 Sept. 2015. Explores the efforts of AIDS-prevention organizations to continue to advocate using condoms to prevent the spread of AIDS and HIV. It has recently been reported that male circumcision lessens the chance of men contracting aids, but condoms must still be used to prevent infection.

["UK Scientists Make Body Parts in Lab."](#) *AP Video News* 2014. *Science in Context*. Web. 4 Sept. 2015. Scientists in a London hospital are growing noses, ears and blood vessels in a bold attempt to make body parts using stem cells. The lab is among several around the world working on the futuristic idea of growing custom-made organs in the lab.

["What are GMOs?"](#) *What are GMOs?* 10 June 2015. *Global Issues in Context*. Web. 4 Sept. 2015.

["Worldfocus Special Edition on Deadly Diseases."](#) *WorldFocus* 29 Mar. 2010. *Global Issues in Context*. Web. 2 Sept. 2015. Examines the continuing battle around to globe to combat and eradicate deadly diseases such as AIDS, malaria and drug-resistant tuberculosis.

## Section 13: Articles

---

"[Agricultural Biotechnology](#)." *Biotechnology*. Ed. Brenda Lerner and K. Lerner. Vol. 1. Detroit: Gale, 2012. 4-8. *Global Issues in Context*. Web. 8 Sept. 2015.

"[The Case for Fetal-Cell Research](#)." *New York Times* 30 July 2015: A23(L). *Global Issues in Context*. Web. 8 Sept. 2015.

"[Different mutations in Ashkenazi Jewish and non-Jewish French Canadians with Tay-Sachs disease](#)." *Science* 232 (1986): 1646+. *Science in Context*. Web. 4 Sept. 2015.

"[DNA, It Turns Out, Is A Lot More Loopy](#)." *Weekend All Things Considered* 10 Jan. 2015. *Global Issues in Context*. Web. 8 Sept. 2015.

"[DNA Vaccines](#)." *Biotechnology*. Ed. Brenda Lerner and K. Lerner. Vol. 1. Detroit: Gale, 2012. 324-326. *Global Issues in Context*. Web. 8 Sept. 2015.

"[The effects of human population structure on large genetic association studies](#)." *Nature Genetics* 36.5 (2004): 512+. *Science in Context*. Web. 8 Sept. 2015.

"[Gene Police](#)." *Biotechnology*. Ed. Brenda Lerner and K. Lerner. Vol. 1. Detroit: Gale, 2012. 415-419. *Global Issues in Context*. Web. 8 Sept. 2015.

"[Health Care Gap](#)." *Encyclopedia of Race and Racism*. Ed. John Moore. Vol. 2. Detroit: Macmillan Reference USA, 2008. 81-86. *Global Issues in Context*. Web. 8 Sept. 2015.

"[Human Genome Diversity Project](#)." *Bioethics*. Ed. Bruce Jennings. 4th ed. Vol. 3. Farmington Hills, MI: Macmillan Reference USA, 2014. 1578-1583. *Global Issues in Context*. Web. 8 Sept. 2015.

"[Hunting for disease genes in Iceland's genealogies](#)." *New York Times* 18 June 2002: F4. *Science in Context*. Web. 8 Sept. 2015.

"[Infectious Disease, Susceptibility, and Race](#)." *Encyclopedia of Race and Racism*. Ed. John Moore. Vol. 2. Detroit: Macmillan Reference USA, 2008. 177-180. *Global Issues in Context*. Web. 8 Sept. 2015.

"[Long delay between Tay Sachs symptoms, diagnosis.](#)" *Reuters Health Medical News* 4 Nov. 2011. *Science in Context*. Web. 8 Sept. 2015.

"[New Hope for Cystic Fibrosis Patients in Medication Derived from Norwegian Seaweed.](#)" MailOnline. Daily Mail, UK. *Science in Context*. Web. 2 Sept. 2015.

"[Now that we can edit our genome, where do we go?](#)" *Washington Post* 19 May 2015. *Global Issues in Context*. Web. 8 Sept. 2015.

**Podcast:** "[Scientists Urge Temporary Moratorium On Human Genome Edits.](#)" *All Things Considered* 20 Mar. 2015. *Global Issues in Context*. Web. 8 Sept. 2015.

"[Seals of doom; Disease transmission.](#)" *The Economist* 23 Aug. 2014: 75(US). *Global Issues in Context*. Web. 8 Sept. 2015.

"[The Sequence of the Human Genome.](#)" *Medicine, Health, and Bioethics: Essential Primary Sources*. Ed. K. Lerner and Brenda Lerner. Detroit: Gale, 2006. 61-65. *Global Issues in Context*. Web. 8 Sept. 2015.

"Study Findings on Stem Cell Research Are Outlined in Reports from Columbia University (['The state of the heart': Recent advances in engineering human cardiac tissue from pluripotent stem cells](#))." *Health & Medicine Week* 11 Sept. 2015: 267. *Global Issues in Context*. Web. 8 Sept. 2015.

"[Three Dimensional Organization of the Nucleus: adding DNA sequences to the big picture.](#)" *Genome Biology* [Online Edition] 16 (2015): 181. *Global Issues in Context*. Web. 8 Sept. 2015.

"[Watson and Crick, Both Aligned and Apart, Reinvented Biology.](#)" *New York Times* 25 Feb. 2003: F3. *Science in Context*. Web. 4 Sept. 2015.

"[We are all Neanderthal: at least partly, as testing on ancient bones and modern humans is now revealing.](#)" *Macleans* 4 Aug. 2014: 52. *Global Issues in Context*. Web. 8 Sept. 2015.