

The Instructor's Guide to Snapshots of Modern History

Vol. 1



*with Supplemental Reading Suggestions,
Film List, Hands-on Activity Instructions,
Vocabulary and Pronunciation Guides,
Timeline and Map Work Instructions,
Review Materials,
Answer Keys,
and more!*

by Vivian Meyers, M.A.

The Instructor's Guide to Snapshots of Modern History Vol. 1

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Curiosity Chronicles, an imprint of Drop Dead Studios LLC
Marysville, OH 43040
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Introduction

The Instructor's Guide to Snapshots of Modern History Vol. 1 is a supplemental resource for *Snapshots of Modern History Vol. 1*. This book provides activities, supplemental reading, definitions, review materials, and more to enrich your experience using *Snapshots of Modern History Vol. 1*. The companion book *A Student's Guide to Snapshots of Modern History Vol. 1* provides worksheets, activity pages, maps, coloring pages, and review materials for student use. Together these two books expand *Snapshots of Modern History Vol. 1* into a complete curriculum.

Snapshots of Modern History Vol. 1 is designed to be a homeschool history curriculum for 5th–8th grade students. Many homeschooling families prefer to teach history as a group subject, teaching multiple grade levels at the same time. As such, this book includes activities and reading suggestions suitable for a wide age range of students. Use your best judgment when selecting which books and activities would best suit your child(ren).

What's Included in The Instructor's Guide to Snapshots of Modern History Vol. 1?

- **General Reading Suggestions:** A short list of general reading suggestions for the whole year is included at the beginning of this book.
- **Sample Schedules:** A handful of sample schedules for using *Snapshots of Modern History Vol. 1* are included to help make planning your year easier.
- A section for each of the 36 chapters in *Snapshots of Modern History Vol. 1*, which includes:
 - **People, Places, and Things:** This section is intended mainly as a reference for instructors. It includes pronunciation guides and short definitions of the proper nouns and other important terms contained in the chapter. This section can be used as a reference for recalling important facts from the chapter or creating your own review questions or activities.
 - **Comprehension Questions:** Each chapter has a selection of comprehension questions. These are basic questions about the information in the chapter. Some are short and have a clear answer. Others are more open-ended and ask a student to recall a broad set of information from the chapter. Sample answers are provided. The student's answer does not need to match the sample answer exactly. On broader questions, the student should not be expected to recall every detail from the chapter but instead show a general comprehension of the topic.
 - **Discussion Questions:** 1–2 discussion questions are provided per chapter. These questions ask deeper, more probing questions about the contents of the chapter. They will ask students to make cross-historical connections, consider multiple viewpoints, or make extrapolations from the contents of the chapter. The depth of discussion these questions create is up to the individual student(s) and instructor. These questions are designed to help students develop critical thinking skills and connect their study of history to other areas of their life. If students are struggling to come up with an answer to a discussion question, instructors are encouraged to provide their own insights to help begin a discussion.
 - **Timeline Dates:** Timeline work is a key component of Curiosity Chronicles. Even though *Snapshots of Modern History Vol. 1* is told in a broadly chronological order, events happened all over the globe contemporaneously, making a strictly chronological history impossible. Timeline work allows students the opportunity to visually see the flow of history and events that were happening in different parts of the globe at the same time. Each chapter lists which events that could be added to the timeline. The Instructor's Guide includes a complete list of dates from each chapter. Because there are so many dates in *Snapshots of Modern History Vol. 1*, the Student Guide includes an **abridged list** of the most important dates. The expansion product Ted's Timeline Kit includes printable wall and notebook timelines as well as printable date markers for important dates in *Snapshots of Modern History Vol. 1*. Ted's Timeline Kit will only include the abridged list of dates so the timeline doesn't become overly crowded. You can use the complete list found in this book if you would like to create date markers for any additional events.
 - **Map work:** Map work is another important component of any history study to ensure students are familiar with where events happened around the globe. Most chapters include a description of a short map activity for students to complete about the events of the chapter.
 - **Coloring page:** The student book contains a coloring page for each chapter, which is also listed in the instructor book.

- A section for each of the 18 sections in *Snapshots of Modern History Vol. I*, which includes:
 - **Reading Suggestions:** Every section includes supplemental reading suggestions. Some topics have more supplemental reading suggestions available than others. These suggestions are divided into picture books, informational books, and chapter books to help you determine which books would work best for your child(ren). A short description of each book is provided.
 - **Cross References:** Relevant pages for the recommended general books are listed for each chapter.
 - **Film Suggestions:** Movies and television shows are a very popular way to study history. Film has the ability to bring historical events to life and create lasting impressions on students. As such, we have included a curated list of suggested films that could improve your study of history. However, films bring their own problems. Please read and consider the following disclaimer before using the film list.

FILM DISCLAIMER: Every historical film is a dual historical artifact. On the one hand, a historical film portrays the appearance, events, and values of the period it depicts. However, at the same time, every film is an artifact of the time period that produced it, showing that period's appearance, cultural concerns, and values. For example, a 1960s film about the Civil War will provide insights into 1860s America, but it will also provide insights into 1960s Hollywood. A 1960s film showing people opposing the violence of the Civil War also reflects the anti-war sentiments popular during the Vietnam War.

Because every film is a dual historical artifact, historical films must always be read critically. Viewing historical films is an excellent opportunity for students to practice critical analysis. Students should ask, "Why is this story told the way it is? What events are included and which are excluded? How do the inclusions and exclusions reveal the director's motivations and general cultural concerns?"

Remember, historical films are always fiction. No matter how faithful a film attempts to be, there will always be fictionalizations. Often, those fictionalizations come at the most emotional moments in the film, as writers seek to craft a compelling scene. Historical films must always be viewed with a grain of salt.

RATINGS AND CONTENT WARNINGS: What content is considered appropriate or inappropriate in a film will vary by family. The rating system designed to help families evaluate the appropriateness of a film has changed dramatically over the decades. We have listed the U.S. rating for each film, but please do not rely on ratings alone to determine appropriateness! The International Movie Database's website imdb.com includes a parent's guide section for every film, which you can use to assess the type of content in a film. This database relies on user-submitted descriptions of films, so it may be incomplete.

We have tried to limit our film list to films that would be considered appropriate for teenagers or younger. This was a challenging endeavor since 'child appropriate' and 'historically accurate' are often mutually exclusive terms. You may disagree with where we drew the line in some places. As such, we strongly encourage you to preview the content and use your best judgment to determine which films will best suit your student(s).

We have included content warnings for films with gratuitous violence and brief nudity. We have not included any films with explicit sexual content. The definition of gratuitous violence is, of course, subjective, but we have generally defined it as films that include highly realistic blood and gore, detailed battle scenes, lingering shots of open wounds, whipping scenes, etc. We have tried to provide timestamps for films with brief flashes of nudity to facilitate skipping those moments if desired. Depending on the film, some other types of content may be flagged, but we have not provided a detailed description of every type of potentially offensive content.

- **Hands-On Activities:** Each chapter includes at least two hands-on activities you can complete with your child. These activities provide important opportunities for kinesthetic learners and for making history fun. There are a variety of activity types to appeal to many different types of learners. In the Modern History level, we have added several activities working with primary sources to deepen students' engagement with historical artifacts and practice textual analysis skills.

- **Minecraft:** Each chapter also includes a suggested Minecraft building activity. Minecraft is a popular game that has many educational benefits. Minecraft can provide your child with a hands-on history project without the mess and expense of many other activities. It is available for PCs, Macs, Android, and iOS devices, as well as Xbox, Playstation, and Kindle Fire. For history class, you will want to play Minecraft offline, using the peaceful and creative mode settings. Other similar building programs could be used instead of Minecraft. Some Minecraft activities could be completed with LEGOs instead, but the scale of some projects may make it difficult to complete them with LEGOs.
- **Review Materials:** Instructions for various review games as well as the questions and answers for certain review activities are included near the end of the book.
- **Answer Key:** An answer key to the various activities in the student book is included at the end of the book. This includes completed map work and answers for the crosswords, word searches, and other activities in the student book.

What's Included in A Student's Guide to Snapshots of Modern History Vol. 1?

- A chapter corresponding to each chapter in *Snapshots of Modern History Vol. 1*, which includes:
 - A vocabulary word and definition match
 - Comprehension and Discussion Questions with space to write answers
 - A list of timeline dates to add
 - Instructions for map work
 - Additional crossword activities
 - A map for the chapter
 - A coloring page for each chapter
 - Some chapters contain additional activity pages or printables to go along with hands-on activities from The Instructor's Guide.
- Printable pages for review activities every six chapters.

General Book Recommendations

The following books are general reference books that would be valuable resources throughout your study of history. Cross references to each relevant book are provided for each chapter. These books may also contain topics not covered in *Snapshots of Modern History Vol. 1* that would enrich your study of history.

The Usborne Encyclopedia of World History: Internet Linked (Usborne Pub Ltd, 2010)

Kingfisher History Encyclopedia (Kingfisher, 2012)

These books are both general encyclopedia reference books for children. Their rich pictures and general information make these books valuable starting places for new topics.

History Year by Year: The History of the World, from the Stone Age to the Digital Age, by Peter Chrisp, Joe Fullman, and Susan Kennedy (DK/Smithsonian, 2013)

This book provides a timeline of world history and short blurbs about important events. The timeline-focused layout can be useful to help students visualize the order of history.

Vincent's Starry Night and Other Stories: A Children's History of Art, by Michael Bird (Laurence King Publishing Ltd, 2016)

This book provides a series of short vignettes of artists and art movements throughout history. It is arranged in chronological order and can offer additional learning on artistic topics throughout this era of history.

The 1900s Decade in Photos: A Decade of Discovery, by Jim Corrigan (Enslow Publishers, 2010)

The 1910s Decade in Photos: A Decade that Shook the World, by Jim Corrigan (Enslow Publishers, 2010)

These books use a variety of photographs, posters, and newspaper clippings to explore major developments in U.S. and world history in each decade.

Sample Schedules

Snapshots of Modern History Vol. 1 contains 36 chapters paired into 18 sections of related topics. The book can be completed at a pace of one chapter per week, which would take a 36-week school year to complete. The book could also be completed more quickly, covering one section per week, so it would take half a school year to complete. You can, of course, complete the book faster or slower.

Depending on your family's schedule, you may wish to complete history in one short session each week, 4-5 short sessions a week, or one long session a week. Sample schedules are provided below for each of those scenarios. Adapt these schedules however you want to create the optimal schedule for your family.

1 Short Session (20-40 minutes) per Week:

- (Every three weeks, begin with a short review activity)
- Read/listen to a chapter from Snapshots of Modern History.
- Choose one of the following:
 - Complete the activity pages, timeline work, map work, and coloring page in the student book.
 - Complete one hands-on activity (some activities will take longer to complete, so if time is a concern, select the activity accordingly).
 - Read 1-2 supplemental books.

1 Long Session (60+ minutes) per Week:

- (Every three weeks, begin with a short review activity)
- Read/listen to a chapter from Snapshots of Modern History.
- Choose two of the following:
 - Complete the activity pages, timeline work, map work, and coloring page in the student book.
 - Complete one hands-on activity (some activities will take longer to complete, so if time is a concern, select the activity accordingly).
 - Read 1-2 supplemental books.

4 Short Sessions (15-30 minutes) per Week:

Day 1:

- Read/listen to a chapter from Snapshots of Modern History.
- (Add a review activity every three weeks)

Day 2:

- Read the relevant pages from the Usborne or Kingfisher Encyclopedia.
- Complete the activity pages, timeline work, map work, and coloring page in the student book

Day 3:

- Read 1-2 supplemental books

Day 4:

- Complete one hands-on activity

5 Short Sessions (15-30 minutes) per Week:

Day 1:

- Read/listen to a chapter from Snapshots of Modern History.

Day 2:

- Read the relevant pages from the Usborne or Kingfisher Encyclopedia.
- Complete the activity pages, timeline work, map work, and coloring page in the student book.

Day 3:

- Read 1-2 supplemental books

Day 4:

- Complete one hands-on activity

Day 5:

- Complete an additional hands-on activity or supplemental reading
- Every three weeks, complete a review activity

4 Short Sessions (30 minutes) per Week, Faster Pace:

Day 1:

- Read/listen to a chapter from Snapshots of Modern History.
- Read the relevant pages from the Usborne or Kingfisher Encyclopedia.
- (Add a review activity every three weeks.)

Day 2:

- Complete the activity pages, timeline work, map work, and coloring page in the student book.
- Read 1-2 supplemental books.

Day 3:

- Read/listen to a chapter from Snapshots of Modern History.
- Read the relevant pages from the Usborne or Kingfisher Encyclopedia.
- (Add a review activity every three weeks.)

Day 4:

- Complete the activity pages, timeline work, map work, and coloring page in the student book.
- Complete one hands-on activity.

5 Short Sessions (30 minutes) per Week, Faster Pace:

Day 1:

- Read/listen to a chapter from Snapshots of Modern History.
- Read the relevant pages from the Usborne or Kingfisher Encyclopedia.

Day 2:

- Complete the activity pages, timeline work, map work, and coloring page in the student book.
- Read 1-2 supplemental books.

Day 3:

- Read/listen to a chapter from Snapshots of Modern History.
- Read the relevant pages from the Usborne or Kingfisher Encyclopedia.
- (Add a review activity every three weeks.)

Day 4:

- Complete the activity pages, timeline work, map work, and coloring page in the student book.
- Complete one hands-on activity.

Day 5:

- Complete an additional hands-on activity or supplemental reading.
- Every three weeks, complete a review activity.

Planning Guide

Date	Chapter	Hands-On Activity & Needed Supplies	Supplemental Reading Choices
<i>Section 1: The Mechanics of Empire</i>			
	Chapter 1: Albert Builds the Crystal Palace		
	Chapter 2: Napoleon III Invades Crimea		
<i>Section 2: The Sun Never Sets on the British Empire</i>			
	Chapter 3: Darwin Classifies Finches		
	Chapter 4: The Queen Takes Over India		
<i>Section 3: British Citizens Abroad</i>			
	Chapter 5: New Zealand and Australia Achieve Self-Rule		
	Chapter 6: Carnarvon Plans Confederations in Canada and South Africa		
<i>Section 4: European Nationalism</i>			
	Chapter 7: The Risorgimento Sweeps Italy		
	Chapter 8: The Kaiser Is Crowned		
<i>Section 5: The Future of the Union</i>			
	Chapter 9: Slavery Divides the Union		
	Chapter 10: The Confederacy Tries to Secede		

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<i>Section 6: Battles for Latin American Wealth</i>			
	Chapter 11: Napoleon Invades Mexico		
	Chapter 12: Spain Tries to Steal Peru's Guano		
<i>Section 7: The Legacy of Slavery</i>			
	Chapter 13: Reconstruction Fails		
	Chapter 14: Puerto Rico, Cuba, & Brazil End Slavery		
<i>Section 8: The Reservation System</i>			
	Chapter 15: Forced Marches to Bosque Redondo		
	Chapter 16: Poundmaker Sues for Peace		
<i>Section 9: Modernization in East Asia</i>			
	Chapter 17: Emperor Meiji Modernizes Japan		
	Chapter 18: China Tries to Self-Strengthen		
<i>Section 10: Colonization in Southeast Asia</i>			
	Chapter 19: Napoleon Alos Invades Vietnam		
	Chapter 20: Chulalongkorn Protects Siam's Independence		

Planning Guide

Date	Chapter	Hands-On Activity & Needed Supplies	Supplemental Reading Choices
<i>Section 11: Colonization in Africa</i>			
	Chapter 21: Europe Scrambles for Africa		
	Chapter 22: Europe Commits Atrocities in Africa		
<i>Section 12: Displacement & Migration</i>			
	Chapter 23: Herzl Dreams of Zion		
	Chapter 24: Immigrants Come to the Americas		
<i>Section 13: Inventions</i>			
	Chapter 25: Bright Ideas Light the World		
	Chapter 26: Invention Takes Flight		
<i>Section 14: Modern Art</i>			
	Chapter 27: Artists Break the Rules		
	Chapter 28: Art Knows No Rules		
<i>Section 15: Consumerism</i>			
	Chapter 29: The Bon Marché Opens Its Doors		
	Chapter 30: Advertisers Sell Desire		

Planning Guide

Date	Chapter	Hands-On Activity & Needed Supplies	Supplemental Reading Choices
<i>Section 16: Women's Rights</i>			
	Chapter 31: Women Advocate for Their Rights		
	Chapter 32: Suffragettes Demand the Vote		
<i>Section 17: Carry a Big Stick</i>			
	Chapter 33: Kalākaua Signs the Bayonet Constitution		
	Chapter 34: Teddy Builds a Canal		
<i>Section 18: The End of an Era</i>			
	Chapter 35: China Tries to Become a Republic		
	Chapter 36: Workers Strike for an Eight-Hour Day		

Section 1: The Mechanics of Empire

Culture Corner: John Stuart Mill

People in This Culture Corner:

- **Harriet Taylor Mill:** Wife of John Stuart Mill; co-author of *On Liberty*.
- **Helen Taylor:** Step-daughter to John Stuart Mill; became Mill's collaborator after her mother's death.
- **John Stuart Mill:** 19th century philosopher who codified Classical Liberalism; primary author of *On Liberty*.
- **Karl Marx:** A 19th century philosopher who created the political philosophy of communism.

Things in This Culture Corner:

- **Benevolent Despotism:** Mill's belief that colonization, while bad, brought education, which increased liberty; thus making colonization an overall good.
- **Classical Liberalism:** Political philosophy that promotes free trade and business and believes governments ought to preserve individual liberty; based on the principles of utilitarianism.
- **Communism:** Political philosophy created by Karl Marx that believes workers should own the means of production and rule collectively.
- **Free Speech:** The ability to freely and openly discuss ideas; Mill believed free speech was essential to promote liberty.
- **Liberty:** The freedom to control your own mind and body.
- **On Liberty:** Book by John Stuart Mill about the principles of liberty.
- **Tyranny of the Majority:** When a majority makes laws and uses social pressure in a democracy to limit a minority's liberty; reason Mill was skeptical about full democracy.
- **Utilitarianism:** A moral philosophy based on practicality and creating the most amount of good for the greatest number of people without unjustly taking away anyone's liberty.

Chapter 1: Albert Builds the Crystal Palace

People in This Chapter:

- **Joseph Paxton:** An elite garden designer who designed the Crystal Palace.
- **Prince Albert:** Husband of Queen Victoria who spearheaded the Great Exhibition.
- **Queen Victoria:** Queen of the British Empire from 1837-1901.
- **Samuel Colt:** Inventor of the Colt 1851, the first revolver to see worldwide use.
- **Shah Jahan:** Mughal emperor from 1628 to 1658 who once owned the Daria-i-Noor.

Places in This Chapter:

- **British Empire:** Countries and colonies ruled by Great Britain.
- **Crystal Palace:** A large glass building designed and built for the Great Exhibition.
- **Hyde Park:** A park in central London; site of the Great Exhibition.
- **London:** Capital of Great Britain.

Things in This Chapter:

- **Great Exhibition:** A predecessor to the World's Fair, the Great Exhibition was an event in London in 1851 dedicated to showcasing technology and inventions.
- **Koh-i-Noor and Daria-i-Noor:** Two large diamonds from India that were displayed at the Great Exhibition.
- **Nationalism:** Political philosophy that involves being extremely proud of a national identity and competitive toward other nations.
- **Navy Revolver (Colt 1851):** The first revolver to see worldwide use, invented by Samuel Colt and showcased at The Great Exhibition.
- **Pageantry:** A spectacular display of power and/or wealth.
- **World's Fairs:** Large international events modeled on the Great Exhibition held around the world to show off cultural and scientific accomplishments.

Comprehension Questions

1. How and why do empires use pageantry? *Pageantry is something that shows off how powerful an empire is. Building cool things, large militaries, and flashy public spectacles are all forms of pageantry used to impress people.*
2. Why was the Great Exhibition held? *To show off to the rest of the world how great Great Britain was.*
3. What were some of the items displayed at the Great Exhibition? *Answers will vary but may include steam engine, telescope, counting machine, voting machine, loom, textiles, diamonds, and more.*

Discussion Questions

1. What are some examples of pageantry from previous eras of history? How did that pageantry help a ruler gain or keep power?
2. Can you think of any examples of pageantry you've personally witnessed? (Answers may include political, sporting, cultural, religious, or other events.)
3. Why do you think pageantry is such an effective tool of empire building?

Map Work

- none

Coloring Pages

- The Great Exhibition

Timeline

- May - October 1851 — The Great Exhibition

Culture Corner: Computing

People in This Culture Corner:

- **Ada Lovelace:** Inventor of punch cards, considered to be the first computer program and author of the first book on computer programming.
- **Alan Turing:** Creator of the modern computer in the 1930s and 1940s.
- **Charles Babbage:** Inventor of the analytical engine, considered to be the first computer.
- **Charles Xavier Thomas:** French inventor of the arithmometer, a mechanical calculator.
- **Luigi Menabrea:** Italian mathematician who transcribed and published notes from Charles Babbage's only lecture on the analytical engine.

Things in This Culture Corner:

- **Arithmometer:** A mechanical calculator that could do basic arithmetic functions including addition, subtraction, multiplication, and division, invented by Charles Xavier Thomas and shown at the Great Exhibition.
- **Analytical Engine:** An all purpose calculator invented by Charles Babbage. The analytical engine included algebraic logic functions, memory, and loops, all of which are core functions of computers today.
- **Bernoulli Numbers:** A sequence of numbers that is a foundational principle of computer programming.
- **Punch Card:** A thick piece of paper with holes punched in it. The location of those holes tells the analytical engine what functions to perform.

Chapter 2: Napoleon III Invades Crimea

People in This Chapter:

- **Claude Étienne Minié** (*klod EE-ti-en mi-nee-E*): French inventor who invented a new type of bullet that was faster and easier to load and much more deadly.
- **Emperor of Russia:** The official protector of all the Christians within the Ottoman empire.
- **Florence Nightingale:** Leader of a corps of nurses in the Crimean War. She advocated for hospital reforms and helped pioneer new methods to visually represent statistical data to make it easier to understand.
- **Mary Seacole:** A Jamaican-born nurse during the Crimean War who pioneered modern nursing while running a successful business.
- **Michael Faraday:** The scientist who refused to develop chemical weapons after being asked by the British government to do so.
- **Napoleon III:** The nephew of Napoleon Bonaparte who crowned himself Emperor of France.
- **Nikolay Ivanovich Pirogov** (*NEE-ko-lai ee-VON-ob-vich PEE-rob-gov*): Russian doctor who greatly improved emergency medicine and was the first to perform field surgery.
- **William Howard Russell:** The first ever war correspondent. Russell was an Irish journalist who worked for *The Times*, a London-based newspaper and wrote compelling articles keeping the British public up-to-date on the Crimean War.

Places in This Chapter:

- **Crimean Peninsula:** A peninsula in Eastern Europe located at the northern shore of the Black Sea; part of the Russian Empire during this era.
- **Ottoman Empire:** A diverse empire that included many different religious and ethnic groups, it faced difficult problems of transitioning from a medieval empire into a modern one.
- **Russia:** A large country in Eastern Europe that invaded the Ottoman Empire in 1853.
- **The British Hotel:** A club in Crimea established by Mary Seacole that became a home away from home for British soldiers.

Things in This Chapter:

- **Allies:** The Ottoman-French-British-Sardinian-Austrian side of the Crimean War.
- **Chemical Weapons:** Weapons that release dangerous chemicals into the air that can harm or kill people.
- **Crimean War:** The first modern war, which shifted European alliances.
- **Imperial Reform Edict:** An order by the Ottoman Sultan that created equality for all people in the empire, regardless of religion.
- **Rifling:** The process of adding grooves to the inside of a gun's barrel to spin the bullet, increasing its distance and accuracy.
- **Sphere of influence:** A place where a country can affect change without formal authority.
- **Tanzimat Reforms:** An era of modernizing reforms in the Ottoman empire.
- **Telegraphs:** Devices that allowed for fast communication over long distances.
- **Trench Warfare:** A type of warfare where trenches are dug for soldiers to stand in while they fire their guns and to take shelter in to avoid enemy fire.

Comprehension Questions

1. What types of reforms did the Ottoman Empire make during the Tanzimat Reforms? *Answers may include: new legal code, abolished medieval guilds, modern banking system, new education system, modern army, decriminalized homosexuality, expanded women's rights, changed religious obligations/exceptions.*
2. Why did the Crimean War start? *Napoleon III became the official protector of Christians within the Ottoman Empire instead of the Russian Emperor. France sent troops to the Black Sea, which sparked a war with Russia. Other countries joined because of their fear or dislike of Russia.*

3. How did warfare change during the Crimean War? *Railroads and telegraphs meant troops were better supplied and informed. Modern weapons like iron ships and naval shells, and rifling changed fighting and made it more deadly. Trench warfare was experimented with. Old tactics like bayonets and cavalry charges were still used.*
4. Who was Florence Nightingale? *A nurse from England who was sent to the Crimean War with a corps of nurses to improve medical care. She introduced cleanliness and whole-patient care to the hospitals. Her reforms were based on statistical data.*
5. Who was Mary Seacole? *A nurse and businesswoman from Jamaica. She also traveled to the Crimean War to provide medical care. She taught the importance of cleanliness to British soldiers, cared for dying men, and ran a successful business until the end of the war.*
6. Who was Nikolay Ivanovich Pirogov? *A Russian doctor who made major advances in medicine during the Crimean War including field surgery, anesthesia, better amputation methods, and casts.*

Discussion Questions

1. How does pageantry apply to warfare?
2. How do you think modern weaponry changes a soldier's experiences during war? (answers may include fighting feels more impersonal, more fear because bombs/bullets could strike at any time, sounds of explosions increase stress, frequent news from home may feel jarring compared to life in the war, etc.)

Map Work

- Color the Black Sea blue. Label it.
- Color the Mediterranean Sea blue. Label it.
- Color the Russian Empire a color of your choice. Label it.
- Color the Ottoman Empire a color of your choice. Label it.

Coloring Pages

- Florence Nightingale & Mary Seacole

Timeline

- Oct 1853 – March 1856 — Crimean War

Section 1 Materials

Suggested Reading List

Picture Books:

Ada Byron Lovelace and the Thinking Machine, by Laurie R. King (Creston Books, 2015)

Ada's Ideas: The Story of Ada Lovelace, the World's First Computer Programmer, by Fiona Robinson (Abrams Books for Young Readers, 2016)

Ada Lovelace, Poet of Science: The First Computer Programmer, by Diane Stanley (Simon & Schuster Books for Young Readers)

Illustrated biographies aimed at younger students of early computer programmer Ada Lovelace.

Ada Lovelace and the Start of Computers, by Jordi Bayarri Dolz (Graphic Universe, 2023)

A graphic novel biography of Ada Lovelace.

Florence Nightingale: Lady with the Lamp, by Trina Robbins (Capstone Press, 2007)

Part of the *Graphic Libraries* series, this graphic novel tells the life story of Florence Nightingale.

Mary Seacole: Bound for the Battlefield, by Susan Goldman Rubin (Candlewick, 2020)

This picture book biography of Mary Seacole covers her life in Jamaica, Panama, Crimea, and London.

Victoria: Portrait of a Queen, by Catherine Reef (Clarion Books/Houghton Mifflin Harcourt, 2017)

This picture book biography details the life of Queen Victoria and the Victorian Age, with primary sources and reproductions of paintings.

Informational Books:

Black Heroes: A Black History Book for Kids: 51 Inspiring People from Ancient Africa to Modern-Day U.S.A., by Arlisha Norwood (Rockridge Press, 2020)

Collection of short biographies of famous Black heroes, including Mary Seacole.

Also recommended for sections 5, 7, 15 and 16.

Fantastically Great Women: True Stories of Ambition, Adventure and Bravery, by Kate Pankhurst (Bloomsbury Children's Books, 2016)

This book provides short biographies of famous women, including Mary Seacole and Ada Lovelace.

Also recommended for sections 2, 13, and 16.

History Spies: The Great Exhibition, by Jo Foster (Macmillan Children's 2009)

This illustrated book takes kids on an undercover time-traveling spy mission to 1851 to visit the Great Exhibition.

Lives of Writers: Comedies, Tragedies (and What the Neighbors Thought), by Kathleen Krull (Clarion Books, 2014)

Part of the *Lives of* series, this book provides short biographies of famous authors. The sections about Charlotte and Emily Brontë and Robert Louis Stevenson are relevant to this chapter.

Also recommended for sections 2 and 5.

Lives of Extraordinary Women: Rulers, Rebels (and What the Neighbors Thought), by Kathleen Krull (Clarion Books, 2014)

Part of the *Lives of* series, this book provides short biographies of famous women. The section about Queen Victoria is relevant to this section.

Also recommended for sections 5 and 9.

Lives of the Musicians: Good Times, Bad Times (and What the Neighbors Thought), by Kathleen Krull (Clarion Books, 2013)

Part of the *Lives of* series, this book provides short biographies of famous musicians. The sections about Peter Ilich Tchaikovsky and William Gilbert and Arthur Sullivan are relevant to this chapter.

Also recommended for sections 4 and 7.

Philosophy for Teens: Core Concepts and Life's Biggest Questions Examined, by Mark Linsenmayer (Rockridge Press, 2022)

This book is designed to help teenagers ask and explore philosophical topics in an accessible way. The book includes a chapter about ethics and a chapter on political philosophy, both of which will help students explore ideas related to John Stuart Mill's work.

The Charge of the Light Brigade, by Deborah Bachrach (Lucent Books, 1997)

In-depth discussion of the Crimean War, including the Battle of Balaclava, with photographs, maps, and quotations. The denseness of the text and level of detail make this book best suited to older students or students with a deep interest in military history.

The Great Book of Badass Women: 15 Fearless and Inspirational Women that Changed History, by Rachel Walsh and Bill O'Neill (LAK Publishing, 2020)

A collection of short biographies of famous women, including Florence Nightingale.

Also recommended for sections 13 and 16.

The Story of Buildings: From the Pyramids to the Sydney Opera House and Beyond, by Patrick Dillon (Candlewick, 2014)

This book includes detailed illustrations and descriptions of how many famous buildings were built. It includes a section on the Crystal Palace, highlighting the innovative building techniques used on the building.

Women in Science: Ada Lovelace, by Nick Pierce (The Salariya Book Company, 2020)

This heavily illustrated biography of Ada Lovelace includes maps and timelines as it explores Ada Lovelace's contributions to science.

Chapter Books:

Ada Lovelace Cracks the Code, by Corinne Purtill (Rebel Girls, 2023)

Part of the *Rebel Girls* book series, this is a middle-grade biography of Ada Lovelace.

At Her Majesty's Request: An African Princess in Victorian England, by Walter Dean Myers (Scholastic Press, 1999)

This chapter book tells the life story of Sarah Forbes Bonetta, an Egbado princess who was taken to England and became the goddaughter of Queen Victoria. The book uses selections from letters written by Bonetta to help bring her character to life and provides insight into Victorian attitudes.

DK Life Stories: Ada Lovelace, by Nancy Castaldo (DK Publishing, 2019)

This colorful and lightly illustrated chapter book biography aimed at middle-grade readers explores the life of Ada Lovelace.

DK Life Stories: Florence Nightingale, by Kitson Jazyuka (DK Publishing, 2019)

This colorful and lightly illustrated chapter book biography aimed at middle-grade readers explores the life of Florence Nightingale.

Dreaming in Code: Ada Byron Lovelace, Computer Pioneer, by Emily Arnold McCully (Candlewick Press, 2019)

Biography aimed at older students of early computer programmer Ada Lovelace.

Florence Nightingale: The Courageous Life of the Legendary Nurse, by Catherine Reef (Houghton Mifflin Harcourt Books for Young Readers, 2016)

Biography of Florence Nightingale featuring photographs and illustrations from her life.

The Crystal Palace Chronicles: The Star of Nimrod, by Graham Whitlock (Grass Roots Productions Ltd, 2021)

This fiction, action-adventure novel follows a boy who time travels back to the Crystal Palace and explores Victorian London with famous figures such as H.G. Wells and Arthur Conan Doyle.

The Diary of Sarah Forbes Bonetta: A Novel, by Victoria Princewell (Scholastic, 2011)

Told as a first-person journal, this book imagines life from the perspective of Sarah Forbes Bonetta, an Egbado princess raised in England as Queen Victoria's goddaughter. The book explores how Sarah was caught between two different cultures.

The Extraordinary Life of Mary Seacole, by Naida Redgrave (Puffin, 2019)

A lightly illustrated biography of Mary Seacole.

The Ghosts in the Castle, by Zetta Elliott (CreateSpace Independent Publishing Platform, 2017)

This fictional middle-grade novel tells the story of Zaria who is spending the summer in England. During her time there, she meets two ghosts, including Queen Victoria's goddaughter Sarah Forbes Bonetta, who need her help finding their way back to their home continent of Africa.

Who Was Beatrix Potter?, by Sarah Fabiny (Penguin Workshop, 2015)

Part of the *Who Was* series, this biography of Beatrix Potter covers the early life, accomplishments, and legacy of the British author of *The Tale of Peter Rabbit*.

Who Was Lewis Carroll?, by Pam Pollack and Meg Belviso (Penguin Workshop, 2017)

Part of the *Who Was* series, this biography of Lewis Carroll covers the early life, accomplishments, and legacy of the Victorian author who wrote *Alice's Adventures in Wonderland* and the "Jabberwocky."

Who Was Queen Victoria?, by Jim Gigliotti (Penguin Workshop, 2014)

Part of the *Who Was* series, this biography of Queen Victoria covers the early life, accomplishments, and legacy of the British monarch.

Classic Literature:

Many classics of children's literature were written during the Victorian Era. These works are out of copyright, so there are many editions available. Below are a selection of some of the most popular children's literature from this era, including recommendations of original text, abridged, illustrated, and graphic novel editions.

These books can be read throughout your study of *Snapshots of Modern History Vol. 1* to provide deeper cultural context. Additional works of classic literature are recommended throughout this guide based on time and location.

Alice's Adventures in Wonderland, by Lewis Carroll (1865)

This novel tells the tale of Alice who falls down a rabbit hole and finds herself in the topsy-turvy world of Wonderland. Alice must make sense of this world full of puns, riddles, and nonsense to make it back to the real world.

Alice's Adventures in Wonderland, by Lewis Carroll (Puffin Books, 2015)

A 150th anniversary edition of *Alice's Adventures in Wonderland*. This original text edition is beautifully illustrated throughout.

The Alice in Wonderland Omnibus Including Alice's Adventures in Wonderland and Through the Looking Glass, by Lewis Carroll (Reader's Library Classics, 2021)

Original text edition of both *Alice's Adventures in Wonderland* and the sequel *Through the Looking Glass* with the original illustrations by John Tenniel.

Alice in Wonderland: The Graphic Novel, by Lewis Helfand and Lewis Carroll (Campfire, 2010)

An abridged graphic novel retelling of *Alice's Adventures in Wonderland*.

Black Beauty, by Anna Sewell (1877)

Told as a first person narrative by the horse Black Beauty, this novel explores the horse's life, the good times and the bad, creating a deep emotional connection with readers. It shows daily life in the 1800s, advocates for animal welfare, and shows the difficulties faced by London cab drivers.

Black Beauty (Illustrated & Annotated): Classic Children's Literature, by Anna Sewell and Leonora Teale (EQ Publishing, 2023)

An original text edition with substantial historical notes and commentary of horse welfare.

Classic Starts: Black Beauty, by Lisa Church (Union Square Kids, 2023)

An abridged and simplified retelling of *Black Beauty*.

Dracula, by Bram Stoker (1897)

While the original was not aimed at children, this book has become a classic of the horror genre and spawned many children's tales about vampires and Dracula. The book tells the story of the Transylvanian vampire Count Dracula who moves to England and begins attacking the town of Whitby. Abraham van Helsing is sent to hunt and kill Dracula.

Dracula, by Bram Stoker (Dover Publications, 2000)

An original text edition of *Dracula*.

Dracula: Graphic Novel Classics, by Bram Stoker and Anthony Williams (PowerKids Press, 2019)

An abridged graphic novel retelling of *Dracula*. The art is line art and not in full color.

Classic Starts: Dracula, by Tania Zamorsky (Union Square Kids, 2007)

An abridged and simplified retelling of *Dracula*.

Peter Pan or Peter and Wendy, by James Barrie (1904 or 1911)

This play/novel tells the story of the boy who didn't want to grow up and escaped to Neverland. The Darling children meet Peter Pan and go on a fantastic adventure to Neverland and battle the infamous Captain Hook.

Peter Pan, by J.M. Barrie (Dover Publications, 2000)

An original text edition of the novel.

Classic Starts: Peter Pan, by Tania Zamorsky (Union Square Kids, 2009)

An abridged and simplified retelling of *Peter Pan*.

Peter Pan: Graphic Revolve: Common Core Editions, by J. M. Barrie and Fernando Cano (Capstone Press, 2015)

Graphic novel adaptation of *Peter Pan* that includes discussion and writing prompts.

Sherlock Holmes, by Sir Arthur Conan Doyle (1887–1902)

This series of books and short stories tell the tales of the hyper-observant detective Sherlock Holmes and his trusty sidekick Dr. Watson. This series popularized the trope of a genius detective solving brain-scratching mysteries.

The Great Adventures of Sherlock Holmes, by Sir Arthur Conan Doyle (Puffin Books, 2011)

An original text edition of eight of Holmes' famous mysteries.

Classic Starts: The Adventures of Sherlock Holmes, by Chris Sasaki (Union Square Kids, 2005)

An abridged and simplified retelling of several of Holme's adventures.

The Charge of the Light Brigade and Other Poems, by Alfred, Lord Tennyson (Dover Publications, 1992)

This collection of poetry by celebrated Victorian poet Alfred, Lord Tennyson includes the poem “The Charge of the Light Brigade” which helped immortalize the fateful cavalry charge in the Crimean War. Tennyson’s war poetry would inspire and guide future generations of British soldiers.

The Strange Case of Dr. Jekyll and Mr. Hyde, by Robert Louis Stevenson (1886)

This novella tells the story of Dr. Jekyll and Mr. Hyde who are in fact the same person. Mr. Hyde lives an up-standing life during the day, while Dr. Jekyll lives a criminal and disreputable life. The two sides of Jekyll/Hyde’s personality struggle for control while Stevenson explores the complexities of Victorian social life.

The Strange Case of Dr. Jekyll and Mr. Hyde, by Robert Louis Stevenson (Dover Publications, 2011)

An original text edition of *The Strange Case of Dr. Jekyll and Mr. Hyde*.

Classic Starts: The Strange Case of Dr. Jekyll and Mr. Hyde, by Kathleen Olmstead (Union Square Kids, 2006)

An abridged and simplified retelling of *Dr. Jekyll and Mr. Hyde*.

The Strange Case of Dr. Jekyll and Mr. Hyde: Graphic Revolve: Common Core Editions, by Robert Louis Stevenson, Carl Bowen and Daniel Ferran (Capstone Press, 2015)

Graphic novel adaptation of *Dr. Jekyll and Mr. Hyde* that includes discussion and writing prompts.

The Tale of Peter Rabbit, by Beatrix Potter (1902)

This novel tells the story of Peter, a young rabbit, and life with his family and the many adventures he gets up to.

A Beatrix Potter Treasury, by Beatrix Potter (Warne, 2007)

An original text edition of ten of Beatrix Potter’s stories, including *Peter Rabbit* with original illustrations. This volume also includes an introduction that provides a biography of Beatrix Potter’s life.

The Wind in the Willows, by Kenneth Grahame (1908)

This novel tells the story of the friendship between Ratty, Mole, Badger, and Mr. Toad. While Ratty, Mole, and Badger prefer the quiet country life, Mr. Toad is constantly getting into trouble. When Mr. Toad buys a new car and dangerously races through the countryside, he ends up in jail and his friends must find ways to support him through his troubles.

The Wind in the Willows, by Kenneth Grahame (Classics Made Easy, 2022)

An original text edition of *The Wind in the Willows*. This edition also includes a comprehensive glossary, biographical article, and historical context to aid with understanding.

Classic Starts: The Wind in the Willows, by Martin Woodside (Union Square Kids, 2006)

An abridged and simplified retelling of *The Wind in the Willows*.

Treasure Island, by Robert Louis Stevenson (1883)

The classic children’s pirate adventure story, this book tells the tale of Jim Hawkins who sets sail with Captain Smollett to hunt for treasure in the Caribbean. During the journey, Long John Silver plans a mutiny. Hawkins and the faithful crew must find a way to outsmart Silver and find the treasure.

Treasure Island, by Robert Louis Stevenson (Dover Publications, 1993)

An original text edition of *Treasure Island*.

Treasure Island: The Graphic Novel, by Tim Hamilton (Puffin Graphics, 2005)

A graphic novel adaptation of *Treasure Island* using black and white illustrations.

Classic Starts: Treasure Island, by Chris Tait (Union Square Kids, 2005)

An abridged and simplified retelling of *Treasure Island*.

Cross References

Kingfisher World History Encyclopedia, p. 338–341; 350–351
History Year by Year, p. 218

Usborne Encyclopedia of World History, p. 338–339

Film List

Black Beauty. Directed by Caroline Thompson, performances by Sean Bean, David Thewlis, and Docs Keepin Time, Warner Bros., 1994. Rated G.

Film adaptation of the classic novel *Black Beauty*.

Finding Neverland. Directed by Marc Forster, performances by Johnny Depp, Kate Winslet, and Julie Christie, Miramax, 2004. Rated PG.

Set in 1903 London, this film explores the personal relationship between *Peter Pan* author J.M. Barrie and family that helped inspire *Peter Pan*. Depicts the lifestyle and values of wealthy English people in the Edwardean period.

Mr. Toad's Wild Ride. Directed by Terry Jones, performances by Steve Coogan, Eric Idle, Terry Jones, and John Cleese, Allied Filmmakers, 1997. Rated PG.

Film adaptation of the classic novel *The Wind in the Willows*.

Mrs. Brown. Directed by John Madden, performances by Judi Dench, Billy Connolly, and Geoffrey Palmer, BBC Scotland, 1997. Rated PG.

Shows the friendship that developed between Queen Victoria and John Brown. Brown was a trusted servant of Victoria's husband Prince Albert. When Albert dies young, Victoria is thrown into a deep depression that John Brown helps her through.

Content Warning: There is a skinny dipping scene 29 minutes into the film that involves brief nudity.

The Charge of the Light Brigade. Directed by Tony Richardson, performances by Trevor Howard, Vanessa Redgrave, and John Gielgud, Woodfall Film Productions, 1968. Rated PG-13.

Film adaptation from an English perspective of the events that led to the disastrous Charge of the Light Brigade during the Crimean War. Long battle sequences, but no gratuitous gore.

The Great Mouse Detective. Directed by Ron Clements, Burny Mattinson, David Michener, performances by Vincent Price, Barrie Ingham, and Val Bettin, Walt Disney Pictures, 1986. Rated G.

Animated film adaptation which reimagines Sherlock Holmes in a world of mice living in London. The great detective Basil of Baker Street must save a missing girl and stop a plot against the mouse world's version of Queen Victoria.

The Young Victoria. Directed by Jean-Marc Vallée, performances by Emily Blunt, Rupert Friend, and Paul Bettany, GK Films, 2010. Rated PG.

Film telling the story of Queen Victoria's ascent to the throne and her courtship, engagements, and early marriage with Albert.

Victoria (TV Series). Created by Daisy Goodwin, performances by Jenna Coleman, Adrian Schiller, and Tommy Knight, Mammoth Screen and PBS Masterpiece, 2017–2019. Rated TV-PG.

Television series following the ascent of Victoria to the throne and her early reign. The final episode of season 3 is about the Great Exhibition.

Hands-on Activities

Jacquard Looms and Binary Numbers Craft

One of Ada Lovelace's sources of inspiration while creating computer programming was the Jacquard loom. The Jacquard loom was a very large loom that could automatically weave complex designs. Thousands of punch cards were fed into the loom. The loom would read each punch card and know what function to perform. In its most basic form, if there was a hole, the loom would make a stitch. If there wasn't a hole, the loom wouldn't make a stitch. By feeding in the commands for multiple colors of thread at once, the simple concept of "yes stitch" or "no stitch" translated into a complete design.

Lovelace connected the concept of "yes stitch" or "no stitch" to binary numbers. Binary numbers were a number system invented by Gottfried Wilhelm Leibniz in 1689. The binary number system only uses ones and zeros to create a complete number system. Using binary numbers, Lovelace could represent all of mathematics with just two symbols. Using the Jacquard loom system, she knew how to make a machine perform tasks with just "yes" or "no" commands. She combined these with Boolean numbers, which is a type of math that uses just "yes" or "no" answers. With these influences combined, computer programming was born. To learn more about Boolean numbers, see the *Minecraft Build: Redstone and Boolean Numbers* activity below.

In this activity, students will explore creating a simplified Jacquard loom design to see the principle of "yes" or "no" functions in action.

Materials:

- Student page 10
- Scrap paper
- Pencil
- Ruler
- Two colors of cardstock or construction paper, two pages of each color
- Scissors or paper cutter
- Glue or tape, optional

Directions:

1. Fold one piece of colored paper in half widthwise. Using the ruler, make light pencil marks near the fold to divide the paper into ten equal pieces. If you're using 8.5" wide paper, each section will need to be .85" wide. You can trim the paper size if desired to make sectioning the paper easier.
2. Using the scissors or paper cutter, cut from the fold to about 1" from the edge at each mark. Do not cut all the way to the edge of the paper. When you are done, you should have a single piece of paper with nine slits cut into it.
3. Repeat steps one and two with the other piece of paper of the same color.
4. Cut the other colored paper into strips that are .75" thick.
5. Look at the design of the 8-bit bunny on student page 10. With your paper, you are going to weave this design. Each row will be created with one paper strip. The black spaces on the design will be created by poking the paper strip up through the correct slit when the black begins and then tucking it back underneath through a slit when the black ends. For the first line, you will poke the strip through the first slit in the paper, then tuck it in the second slit. Poke the strip up again at the seventh slit, and tuck in at the eighth slit. Once you've woven each line, slide the strip up so it lays in a straight line below the previous row (or top edge). You can use a small piece of tape or a dot of glue to secure the ends of each completed row to help it stay in place while you work on later rows. Repeat this process until you've woven all ten rows of the design.
6. Now it's your turn to make your own woven design! Use the blank template on student page 10 to draw your own 8-bit style design.
7. To practice the concept of binary numbers, simplify your design into dots and dashes on another piece of paper. Every square that is colored should be represented with a dash. Every square that is empty should be represented with a dot. The first line of the bunny design would look like this: . - - . .

8. See if you can weave your design with the remaining paper by only looking at your dots and dashes description. Try not to look at your colored design. Reading dots and dashes like this is similar to how computers read millions of lines of 1s and 0s to generate pictures.

Curate A World's Fair Exhibit

World's Fairs gave people the opportunity to see and experience culture and technology from across the world that they had never experienced before. Each country creating an exhibition at a World's Fair was tasked with choosing specific items that would represent their country well and impress the rest of the world. In this activity, you will curate an exhibit about your home and family to better understand the curation process and the decisions involved.

Materials:

- Placards found on student page 11
- Materials to type or handwrite descriptions
- Items from around your home

Directions:

9. Pretend you are curating an exhibit on your family and home to be included as part of your country's exhibit in the first-ever Intergalactic Fair. This fair will be attended by alien species from across the galaxy who are unfamiliar with Earth life. Your exhibit should display normal Earth life but also be interesting and impressive to the alien viewers. Because of space limitations, your exhibit will be strictly limited to just eight items. These eight items should include two items each from the four main categories on display: Science and Technology, Art, Culture, and Medicine.
10. For the science and technology category, choose two items to include that display the most advanced and useful technology in your home. Fill out a placard naming each item and identifying its main use, such as "Refrigerator, storing and chilling food." Type or handwrite a more detailed description of each item. These descriptions should impress alien visitors, so be sure to talk up the many features and usefulness of each item.
11. For the art category, choose two paintings, sculptures, photographs, crafts, or pieces of music to include in your exhibit. Fill out the placards with the name of the piece and the artist/creator. Write or type a more detailed description that explains why this work of art was chosen and why it is important to your family and Earth culture.
12. For the culture category, choose two items that represent your culture. This could include food, clothing, art, religious items, and more. Fill out the placards with the name of the item and its function. Write or type a more detailed description that explains why this item was chosen and why it is important to your family and Earth culture.
13. For the medicine category, choose two items from your home that are used to provide medical care, such as medical equipment, medications, or medical records. Fill out a placard naming each item and identifying its main use. Write or type a more detailed description of each item that highlights the usefulness of each item. Remember to impress your reader with your advanced medical options.
14. Gather as many of the items as possible in one location and arrange them in an interesting display. Place the placards and descriptions near each item. For large, fragile, or immobile items, place the placard and descriptions next to the item's usual location.
15. Ask a family member to pretend to be a visiting alien and give them a tour of your exhibit. Show them the items and descriptions and answer any follow-up questions they have.

Minecraft Build: Redstone and Boolean Numbers

Ada Lovelace created the foundation of computer programming using Boolean numbers, also known as Boolean logic. Boolean logic was created by George Boole in 1847. Boolean logic is a type of algebra. Instead of using variables with numeric values like traditional algebra, Boolean logic uses logic statements that always have a “yes” or “no” answer. Everything in Boolean logic boils down to “yes” or “no,” or another way to think of it is “on” or “off.” Minecraft includes a building material called redstone. Redstone operates using Boolean logic.

In this activity, students will explore the foundation of computer programming by building some basic redstone contraptions. Because redstone operates using Boolean logic, the possibilities of redstone are nearly endless, just like computer programming. Advanced users have built calculators, machines, and computers all inside of Minecraft using redstone. This activity will only cover the basics. If you want to know more, there are books, websites, and video tutorials with more information. Minecraft Education Edition is a great starting place for more details.

Boolean Logic Functions:

There are three basic functions you can perform with Boolean logic: OR, NOT, and AND. Creating these functions in the correct order is the beginning of computer programming.

To build these with redstone, users will lay redstone dust lines connected with different redstone devices. The type and order of devices determine what type of function is performed.

Below are explanations of the three basic Boolean logic functions and how to create each one with redstone. These sample builds will be used to turn a light on or off.

OR Functions:

An OR function is created by connecting two sources of input to one output. If input A or input B is on, then the output will be on. If neither input A or input B is on, then the output will be off. Below is a logic table showing all the possible input and output options in an OR function.

Input 1	Input 2	Output
On	On	On
On	Off	On
Off	On	On
Off	Off	Off

Building OR Functions with Redstone:

1. Place two redstone lamps with one empty block space between them.
2. Place a lever on each block, both facing the same direction. The side with the levers will be referred to as the ‘back.’
3. Stand on top of each redstone lamp and place a redstone repeater in front of the lamp. It is important that you’re standing on the redstone lamp and facing forward when you place the repeater so they face the right direction. The lights on the repeater should be perpendicular to the lamp, with the short red line closest to the lamp. If the repeater is placed facing any other direction, then the gate will not work.
4. Place redstone dust in front of each redstone lamp/repeater for a few blocks.
5. Connect these two redstone lines together with a block of redstone dust.
6. Run a single redstone dust line forward a few blocks from these now-connected redstone lines, creating a Y shape.
7. Place a third redstone lamp on the end of the connected line. If you have done this correctly, when you toggle either or both starting levers on, the third redstone lamp will activate. Toggling one starting block will not affect the other starting block.

NOT Functions:

A NOT function is created by connecting one input to one output. The output will not be the same as the input. So if the input is on, the output will be off. If the input is off, the output will be on.

Input	Output
On	Off
Off	On

Building NOT Functions with Redstone:

1. Place a redstone lamp and a lever on the back of it, as you did with the 'OR' gate. Make sure the lamp is off.
2. Place a small line of redstone dust in front of the redstone lamp.
3. Place a stone or wood block at the end of the redstone dust line.
4. Place a redstone torch on the front of the wood/stone block (the side opposite the redstone dust line).
5. Place a line of redstone dust in front of the redstone torch. The redstone dust should be lit up as soon as you lay it.
6. Place another redstone lamp at the end of the line of redstone dust. If you have done this correctly, the second redstone lamp should be lit, and the starting redstone lamp on it should be unlit. Toggling the lever will cause the starting redstone lamp to turn on, which will cause the second redstone lamp to turn off.

AND Functions:

An AND function is created by connecting two sources of input to one output. The output will be on if input A and input B are on. Otherwise, the output will be off.

Input 1	Input 2	Output
On	On	On
On	Off	Off
Off	On	Off
Off	Off	Off

Building AND Functions with Redstone:

1. Build TWO modified NOT gates parallel to each other with the following instructions:
 - Place a redstone lamp with a lever on the back of it. Make sure the lamp is off.
 - Place a small line of redstone dust in front of the redstone lamp.
 - Place a stone or wood block at the end of the redstone dust line.
 - Place a redstone torch on the front of the wood/stone block (the side opposite the redstone dust line).
 - **MODIFICATION:** Standing on top of the wood/stone block, place a redstone repeater in front of the redstone torch. The repeater should be lit as soon as you place it.
 - Place a line of redstone dust in front of the redstone repeater. The redstone dust should be lit up as soon as you lay it.
 - **MODIFICATION:** Connect the redstone dust lines from the parallel NOT gates.
2. Place a single line of redstone dust coming out of these conjoined redstone dust lines, forming a Y shape (like you did with the OR gate above).
3. At the end of this line of redstone dust, place a stone or wood block.
4. Place a redstone torch on the opposite side of the stone/wood block. The torch should be unlit as soon as you place it.
5. Place a line of redstone dust in front of this redstone torch.
6. Place a redstone lamp at the end of the redstone dust line. If your 'AND' gate is built correctly, the redstone lamp at the end of your gate should only turn on if both the starting lamps are turned on.

Those are the basics of creating Boolean logic functions with Redstone! More advanced expressions can also be created by linking different functions together. Have fun exploring the possibilities of Redstone!

Minecraft Build: The Crystal Palace

Create a Minecraft world to be the home of your many history creations throughout this school year. You will want this world to be in creative mode, so you can easily build with any material. You may want to set the world to Peaceful so that there are no monsters (you wouldn't want a creeper to blow up your work!).

Once you've created your Minecraft world, explore the world to become familiar with its geography. Make a map, so that later you can find different areas of the world.

The Crystal Palace was a massive steel and glass exhibit hall built to house the Great Exhibition. In your Minecraft history world, choose a large grassy area to represent London's Hyde Park. The Crystal Palace was a long, three-story building with a grand arch for the roof. Each level of the building was smaller than the last, creating a stair-step design. Two long wings extended out of the center of the building on each side. Create your version of the Crystal Palace using glass blocks. Build the center section three stories high, with an arched fourth story. Each story should be smaller than the one before it to create a stair-step look.

Rounded arches are difficult to make in Minecraft, so do your best by creating diagonal lines to create the illusion of a curved surface.

Build two long wings on either side of the center section, three stories high and matching the stair-steps of the center section.

You can use birch fencing and red wool to create flagpoles along the top story. Place a large flag pole at the top of the arch.

The Crystal Palace was a grand building intended to showcase the British Empire, so add in decorative arches within each level of the facade. Include a wide walkway leading to the building with a fountain in the center.

Section 2: The Sun Never Sets on the British Empire

Chapter 3: Darwin Classifies Finches

People in This Chapter:

- **Alfred Russell Wallace:** Scientist who proposed a nearly identical theory to Charles Darwin's, they published their findings on the same day.
- **Carl Linnaeus** (*lin-EE-us*): Scientist who introduced the modern method of classifying animals.
- **Charles Darwin:** Naturalist who developed the theory of evolution and natural selection.
- **Charles Lyell:** Scientist who developed the theory of uniformitarianism.
- **Erasmus Darwin:** Charles Darwin's grandfather who was an early supporter of the theory that all animals shared a common ancestor.
- **Francis Galton:** Darwin's half-cousin who came up with the theory of eugenics in the 1860s.
- **Georges Cuvier** (*JOR-je KOO-vee-eb*): Scientist who claimed that species had gone extinct throughout history because of cataclysms.
- **Gregor Mendel:** Scientist who discovered the basic principles of genetics by studying pea plants.
- **Mary Ann Mantell:** Fossil hunter who discovered the Iguanodon in 1822.
- **Mary Anning:** A prolific fossil hunter in England in the early to mid 1800s.
- **Richard Owen:** Coined the term "dinosaur" in 1841.
- **Thomas Huxley:** Friend of Charles Darwin and a fierce agnostic who publicly defended evolution from religious critics.
- **Thomas Malthus:** Economist who argued that populations will always continue to increase in size until there is too little food to support the population.
- **William Buckland:** Published research on the megalosaurus in 1824.

Places in This Chapter:

- **Galapagos Islands** (*ge-LAP-ab-gos*): An isolated island group off the coast of South America where Darwin encountered a host of unique animals.

Things in This Chapter:

- **Cataclysm:** Large scale and violent event, such as a volcanic eruption or meteorite impact.
- **Eugenics:** Theory that humans could intentionally create "more evolved" and "better" children over several generations.
- **Genetics:** Study of heredity or how traits are passed from parent to child.
- **Geologist:** Scientists who study rocks, rock formations and the history of the Earth.
- **HMS Beagle:** Ship which took a scientific expedition to chart the coast of South America with Charles Darwin as naturalist on board.
- **Natural Selection:** Theory that animals have to compete with each other to survive.
- **Naturalist:** Scientists who study living things.
- **Social Darwinism:** Theory that took Darwin's theory of survival of the fittest and applied it to social class. It argued the upper class worked harder and deserved their benefits, while the lower class was weaker and deserved their challenges.
- **Theory of Evolution:** Theory proposed by Charles Darwin that explained the origin of plant and animal life on earth.
- **Uniformitarianism:** Theory that argues that natural processes do not change.

Comprehension Questions

1. What were some important scientific discoveries before Darwin that paved the way for the theory of evolution? *Answers may include similarities and family-like relationship between different animals, proof of extinct animals, proof of animal change over time, uniformitarianism.*
2. What are some pieces of evidence that helped Darwin create the theory of evolution? *Answers may include, seashells at the top of cliffs, giant extinct versions of modern animals, unique species on the Galapagos Islands, many variations in Galapagos finches, etc.*
3. Why was the theory of evolution controversial? *Because it speculated about the origin of life, which is a scientific and religious topic. The theory contradicted some religious beliefs.*
4. What were some of the impacts of the theory of evolution? *Better scientific understanding of the origin of life, a growing divide between scientific and religiously minded people, the theory of social darwinism, the theory of eugenics.*

Discussion Questions

1. The theory of evolution didn't just change people's views on the origin of life, but it also shifted how people viewed daily life. The theory made popular the idea that living creatures are in competition and the weak will die. How might an idea like that change how humans interact with each other?
2. How do you think someone's beliefs about the origin of life affect their view of other people?
3. Discuss the theory of eugenics. Why might it attract so many supporters? What are some real-world problems with the theory?

Map Work

- Label each of the continents.
- Trace the path of Charles Darwin's voyage by copying the map found on page 24 of *Snapshots of Modern History Vol. 1*.

Coloring Pages

- Galapagos Islands animals

Timeline

- November 1859 — *On the Origin of Species* published
- 1864 — Pasteurization invented
- July 1885 — First human rabies vaccine

Culture Corner: Louis Pasteur

People in This Culture Corner:

- **Eugene Poubelle** (*OO-jen poo-BELL*): Mayor of Paris who mandated that all buildings in Paris have trash cans and all Parisians use them.
- **Felix Pouchet** (*poo-SHEH*): Scientist who attempted to prove spontaneous generation was correct.
- **Francesco Redi** (*fran-CHES-ko REH-dee*): Italian scientist who conducted experiments in the 1600s to prove that maggots are baby flies.
- **Joseph Lister**: English doctor who pioneered the practice of sterilizing surgical equipment.
- **Lazzaro Spallanzani** (*la-ZA-rob speh-lan-ZAH-nee*): Scientist who conducted experiments that disproved spontaneous generation in the 1700s, but he was not believed.
- **Louis Pasteur** (*LOO-ee pas-TOOR*): Scientist who discovered chirality and pasteurization, proved germ theory correct, and invented multiple vaccines.
- **Marie Pasteur** (*ma-REE pas-TOOR*): Louis Pasteur's wife and laboratory assistant.

Things in This Culture Corner:

- **Chiral molecule** (*ki-ral*): A mirror-image molecule.
- **Chirality** (*ki-ral-ity*): One of the foundational concepts behind pharmaceutical drugs today.
- **Germ Theory:** Theory that disease, mold, etc are spread through microscopic organisms.
- **Pasteurization:** The process of heating a liquid to kill the germs inside it.
- **Spontaneous generation:** Debunked theory that things like maggots, mice, and mold just appeared.

Chapter 4: The Queen Takes Over India

People in This Chapter:

- **Bahadur Shah Zafar** (*BAH-door shah za-FAR*): Last emperor of the Mughal Empire.
- **John Locke:** English enlightenment philosopher who wrote about the social contract, consent of the governed, and human rights.
- **Mahatma Gandhi:** British-educated Indian who will later lead the Indian independence movement.
- **Mangal Pandey** (*MAN-gahl PAHN-dee*): Sepoy who shot at British officers and called on his fellow sepoys to rebel; he was arrested and put to death.
- **Sepoys** (*SEE-pois*): Indian soldiers hired to serve in the East India Company's army.
- **Rajas and Maharajas:** Indian princes who ruled over smaller countries.

Places in This Chapter:

- **Bengal:** Region in east India.
- **Delhi:** City in India; home of the Mughal Emperor.
- **Meerut:** City in India; site of the beginning of the Sepoy Rebellion.

Things in This Chapter:

- **Battle of Plassey:** Battle where the British East India Company defeated Bengal in 1757 and won the right to tax Bengal.
- **British East India Company:** Company that ruled most of India until 1857; the British monarch and many Members of Parliament owned large shares in and profited from the British East India Company.
- **British Raj:** Period of history from 1858 to 1947 where Britain ruled India.
- **Caste:** Indian system of hereditary classes; originate as part of Hinduism to help people achieve their role in life; used by the British to keep Indians divided into easily controlled groups.
- **Doctrine of Lapse:** British decree that Indian princes were free to rule their ancestral lands as long as leadership stayed within a direct male bloodline.
- **Government of India Act:** Act dissolving the British East India Company and giving control of India to the British government.
- **Sepoy Rebellion:** Revolt of the Indian sepoys against the British in 1857; its failure led to the British Crown seizing full control of India.
- **Tariffs:** Taxes used to increase the price of goods being shipped to or from other countries.

Comprehension Questions

1. How did the British extract wealth from India? *High taxes, claiming land in exchange for unpaid taxes, strategic taxes to destroy Indian industry, treaties with rajas and maharajas to ally with the British, Doctrine of Lapse to claim even more land, exploiting old class and religious conflicts to keep Indians divided.*
2. What led to the Sepoy Rebellion? *Growing distrust of the British among sepoys. They feared the British would make them convert to Christianity. The fat on the gunpowder casings fed rumors and ultimately led to the rebellion.*
3. How did the British react to the Sepoy Rebellion? *With extreme brutality. They killed many Indians and violated their religious beliefs as an act of revenge.*
4. What are some of the consequences of British rule in India? *Extreme poverty, famine, and increased conflict.*

Discussion Questions

1. In what ways do you think British views on race, European superiority, and eugenics impacted British actions in India?

Map Work

- Color British-controlled India a color of your choice. Label it.
- Label the dot for the city of Delhi

Coloring Pages

- Silk merchants in India

Timeline

- May 1857 to November 1858 — Sepoy Rebellion
- August 1858 — Great Britain assumes control of India

Section 2 Materials

Suggested Reading List

Picture Books:

A Shot in the Arm!, by Don Brown (Amulet Books, 2021)

Graphic novel that explores the ideas and developments that led to vaccines from smallpox to COVID-19.

Charles Darwin's Around the World Adventure, by Jennifer Thermes (Abrams, 2016)

Picture book biography of Charles Darwin's early life and travels on the *HMS Beagle*.

Charles Darwin's On the Origin of Species: Words That Changed the World, by Anna Brett (Laurence King Publishing, 2021)

A beautifully illustrated introduction of Darwin's theory that uses accessible language to explain the scientific concepts.

Graphic Libraries: Louis Pasteur and Pasteurization, by Jennifer Lee Fandel and Charles Barnett III (Capstone Press, 2007)

Part of the *Graphic Libraries* series, this graphic novel biography explores the life and discoveries of Louis Pasteur.

Gregor Mendel: The Friar Who Grew Peas, by Cheryl Bardoe (Abrams Books for Young Readers, 2015)

This picture book explains the basic principles of genetics and how Gregor Mendel discovered them.

Louis Pasteur and the Power of Observation, by Jordi Bayarri Dolz (Graphic Universe, 2023)

Graphic novel biography of Louis Pasteur.

Mary Anning Breaks New Ground: Courageous Kid of Paleontology, by Carol Kim (Capstone Press, 2022)

Part of the *Graphic Libraries* series, this graphic novel tells the life story of Mary Anning.

The Great Stink: How Joseph Bazalgette Solved London's Poop Problem, by Colleen Paeff (Margaret McElderry Books, 2021)

This picture book aimed at younger students tells the story of the creation of London's sewer system, saving people from cholera outbreaks.

Informational Books:

Darwin and Evolution for Kids: His Life and Ideas with 21 Activities, by Kristan Lawson (Chicago Review Press, 2003)

A non-fiction introduction to Charles Darwin and the theory of evolution with hands-on activities.

Fantastically Great Women: True Stories of Ambition, Adventure and Bravery, by Kate Pankhurst (Bloomsbury Children's Books, 2016)

This book provides short biographies of famous women, including Mary Anning.

Also recommended for sections 2, 13, and 16.

Gregor Mendel: Genetics Pioneer: Life Science, by Lynn Van Gorp (Teacher Created Materials, 2007)

Nonfiction book uses photographs and text to explore the life of Gregor Mendel.

Gregor Mendel and the Roots of Genetics, by Edward Edelson (Oxford University Press, 1999)

Provides an in-depth biography of Gregor Mendel and the creation of modern genetics.

Illustrated Atlas of India, by Dorling Kindersley (DK, 2020)

Illustrated historical atlas of the land, people, and culture of India. Includes a chapter on the British Raj.

Lives of Writers: Comedies, Tragedies (and What the Neighbors Thought), by Kathleen Krull (Clarion Books, 2014)

Part of the *Lives of* series, this book provides short biographies of famous authors. The section about Frances Hodgson Burnett is relevant to this section.

Also recommended for sections 1 and 5.

Lives of the Scientists: Experiments, Explosions (and What the Neighbors Thought), by Kathleen Krull (Clarion Books, 2014)

Part of the *Lives of* series, this book provides short biographies of famous scientists. The sections about Charles Darwin and Louis Pasteur are relevant to this chapter.

Also recommended for section 13.

Chapter Books:

Charles and Emma: The Darwins' Leap of Faith, by Deborah Heiligman (Henry Holt & Co., 2009)

This award winning book explores the relationship between Charles and Emma Darwin. Emma held strong Christian convictions and struggled with the implications of Charles's work. The book explores how their different worldviews impacted their marriage and Darwin's work.

Fossil Hunter: How Mary Anning Changed the Science of Prehistoric Life, by Cheryl Blackford (Clarion Books, 2022)

Biography of Mary Anning that includes photographs and illustrations from her lifetime.

Germ Hunter: A Story about Louis Pasteur, by Elaine Marie Alphin (LernerClassroom, 2003)

Chapter book biography of Louis Pasteur.

Lightning Mary, by Anthea Simmons (Andersen Press, 2020)

A first-person novelization of the life of Mary Anning.

On the Origin of Species: Young Readers Edition, by Rebecca Stefoff and Charles Darwin (Simon & Schuster, 2018)

A fully illustrated young readers edition of *On the Origin of Species*. This book simplifies Darwin's language and streamlines the text while trying to preserve as much of his original language as possible to make it accessible to modern, young audiences.

Strong as Fire, Fierce as Flame, by Supriya Kelkar (Lee & Low Books, 2021)

This middle-grade novel by award-winning author Supriya Kelkar follows the story of Meera during the Sepoy Rebellion. Meera is raised in a fringe Hindu sect and is expected to throw herself on her husband's funeral pyre after he is killed in the rebellion. Instead, Meera runs away and becomes a servant to a British officer, where she discovers a stash of arms. She must choose between safety and alerting the rebels. The book explores Meera's complicated relationship to religion, identity, and colonization.

The Great Trouble: A Mystery of London, The Blue Death, and a Boy Called Eel, by Deborah Hopkinson (Knopf Books for Young Readers, 2013)

Historical fiction set in 1854 London during a Cholera outbreak follows the story of Eel and Florrie who are gathering evidence to prove germ theory correct to stop the outbreak.

Where Are the Galapagos Islands?, by Megan Stine (Penguin Workshop, 2017)

Part of the *Who Was* series, this book covers Darwin's time on the Galapagos Islands, the animals and birds on the island, and modern human threats to the island.

Who Was Charles Darwin?, by Deborah Hopkinson (Penguin Workshop, 2005)

Part of the *Who Was* series, this biography of Charles Darwin covers the early life, journey on the Beagle, writing, and legacy of the British scientist.

Classic Literature:

The Jungle Book

Tells the story of the human boy Mowgli growing up in the jungles of India surrounded by animal characters like the tiger Shere Khan, panther Bagheera, and bear Baloo. This book was written by Rudyard Kipling, a British man who was born and spent his young adult years in India. Kipling is writing from a white, colonizer perspective and using the setting of India for his stories. Kipling was wildly popular in his lifetime. If you choose to read Kipling, please do so with a critical eye. Racist and colonialist ideas are present throughout.

The Jungle Book, by Rudyard Kipling (Harper Design, 2016)

A heavily illustrated, original text edition of *The Jungle Book*.

The Jungle Book: The Graphic Novel, by Dan Johnson and Rudyard Kipling (Campfire, 2012)

A graphic novel adaptation of *The Jungle Book*.

The Secret Garden

Tell the story of Mary Lennox who moves from British India to Misselthwaite Manor in England. As Mary adjusts to life in England, she helps revive a locked away garden and forms a close friendship with her frail cousin, Colin.

The Secret Garden, by Frances Hodgson Burnett (Dover Publications, 1999)

An original text edition of *The Secret Garden*.

The Secret Garden: A Graphic Novel, by Mariah Marsden (Andrews McMeel, 2021)

A graphic novel adaptation of *The Secret Garden*.

Classic Starts: The Secret Garden, by Martha Hailey DuBose (Union Square Kids, 2005)

An abridged and simplified retelling of *The Secret Garden*.

Cross References

Kingfisher World History Encyclopedia, p. 368–369
History Year by Year, p. 219

Usborne Encyclopedia of World History, none

Film List

Creation. Directed by Jon Amiel, performances by Paul Bettany, Jennifer Connelly, and Ian Kelly, Recorded Picture Company and BBC Films, 2009. Rated PG-13.

Explores Charles Darwin's relationship with Emma Darwin, his scientific work, and how those two things came into conflict. Emma was a devout Christian who feared the implications of Darwin's work. Darwin was torn between a commitment to his wife and his work.

Pirates! Band of Misfits. Directed by Peter Lord and Jeff Newitt, performances by Hugh Grant, Salama Hayek, Martin Freeman, Imelda Staunton, and David Tennant, Columbia Pictures, 2012. Rated PG.

Not historically-accurate, but a fun children's movie that includes several people from this section, such as Charles Darwin and Queen Victoria.

The Secret Garden. Directed by Agnieszka Holland, performances by Kate Maberly, Maggie Smith, and Heydon Prowse, Warner Bros., 1993. Rated G.

The Secret Garden. Directed by Marc Munden, performances by Dixie Egerickx, Richard Hansell, and David Verrey, STX Films, 2020. Rated PG.

Film adaptations of Frances Hodgson Burnett's classic novel *The Secret Garden* set in Victorian England.

Victoria & Abdul. Directed by Stephen Frears, performances by Judi Dench, Ali Fazal, and Tim Pigott-Smith, Focus Features, 2017. Rated PG-13.

Set in 1887, this film shows the friendship between an elderly Queen Victoria and her Indian secretary Abdul Karim. Explores race and class expectations of the era as well as relations between Great Britain and India.

Hands-on Activities

Understanding Genetics with Punnett Squares

Gregor Mendel discovered how traits are passed from parent to child, beginning the study of genetics. In this activity, students are introduced to the basics of genetics and how to use Punnett squares to predict genetic outcomes.

Materials:

- Worksheets found on student pages 23–24

Directions:

1. Complete the worksheets. Answers to the worksheets are found below.
2. If desired, look up additional books, videos, or educational materials to deepen your study of genetics.

Answer Key:

Genotype and Phenotype Practice:

Round peas (R) are dominant to wrinkled (r).

Rr **Round**
RR **Round**
rr **Wrinkled**

White wings (W) are dominant to yellow (w)

WW **White**
Ww **White**
ww **Yellow**

Red flowers (R) are dominant to white (r).

RR Red
Rr Red
rr White

Punnett Square Practice:

What percent of offspring will have tail spikes? **100%**

What percent of offspring will curl their tongue? **75%**

Long tails (T) are dominant to bobtails (t)

TT **Long tail**
tt **Bobtail**
Tt **Long tail**

White flowers (p) are recessive to purple (P)

pp **White**
Pp **Purple**
PP **Purple**

Type A blood is dominant to Type O blood

AA A
AO A
OO O

What percent of offspring will be short? **50%**

What percent of offspring will have curly hair? **50%**

Germ Theory Experiment

Louis Pasteur finally and conclusively proved germ theory is correct. This discovery led to various changes throughout the world, including how food is stored and prepared, how trash is managed, and how surgery is performed. Joseph Lister began sterilizing surgical equipment based on Pasteur's discoveries, dramatically improving medical safety. In this activity, students will collect and grow bacteria samples to see the importance of Pasteur's discoveries.

Materials:

- Student pages 25–26
- Petri dishes with agar
- Sterile swabs
- Marker
- Zipper-lock bags
- Location to keep Petri dishes warm, such as under a hot lamp or inside a portable cooler filled with bottles of hot water
- Kitchen knife

- One or more types of face masks (cloth, surgical, KN95, or N95)
- Handsoap
- Sanitizing method, such as a dishwasher or pot of boiling water

Directions:

1. In this experiment, you will be examining germ sources similar to the earliest changes in medicine created by Pasteur's discovery. You will swab eight sources for this experiment. For each swab location, follow these steps:
 - Using a marker, label the bottom of the Petri dish with the sample name. Be sure to label the bottom, not the lid, so there won't be an accidental mix-up.
 - Remove a sterile swab from its packaging, being careful to only touch the stick end of the swab.
 - Drag the swab back and forth across the testing surface.
 - Drag the swab across the top of the agar inside the Petri dish.
 - Place the lid on top of the Petri dish.
 - Place the Petri dish inside a zipper-lock bag and seal the bag. Leave the Petri dish inside these bags for the rest of the experiment and dispose of them in the still sealed bags when the experiment is done so the germs cannot spread.
 - Place the Petri dish in a warm, dark environment. The ideal temperature is around 98 F. Cooler temperatures will lead to slower bacteria growth. Higher temperatures will kill certain types of bacteria.
2. Swab locations:
 - Kitchen knife after preparing a meal, preferably a meal that involves cutting raw meat.
 - Kitchen knife after cleaning it by hand with your normal kitchen cleaning supplies.
 - Kitchen knife after sanitizing it in the dishwasher or immersing it in a pot of boiling water for one minute.
 - Your hands after going about your day normally.
 - Your hands after washing them normally (whatever your typical hand washing length and materials are).
 - Your hands after washing them thoroughly with soap for 30 seconds. Be sure to scrub each part of your hands and dry your hands with a clean paper towel.
3. Two of your bacterial locations don't require a swab. Instead, you will breathe onto the Petri dish.
 - Breathe directly onto the Petri dish.
 - Wearing a mask, breathe onto the Petri dish.
4. If you would like to test different mask types, repeat with a new dish for each type of mask.
5. Use the lab sheet on student pages 25–26 to track the growth of your bacteria over a week. Remember, do not open the zipper bags or Petri dishes once the bacteria has begun to grow.
6. Answer the questions at the bottom of the lab sheet.
7. Dispose of the Petri dishes in the still-sealed zipper bags.

Minecraft Build: Red Fort of Delhi

The Red Fort of Delhi was built in 1638 and served as the home of the Mughal emperors. Much of the interior of the fort was destroyed by British troops during the Sepoy Rebellion, but the outer fortress walls were unharmed. The fort was later used as a place to house soldiers and is now a UNESCO World Heritage Site.

The Red Fort gets its name from the red sandstone that comprises its 75-foot-high walls. In your Minecraft world, choose red sandstone or concrete to build a large square to represent the outer fortress. In the center of the front wall, build a square platform protruding from the main wall. The square platform should come halfway up the wall's height. Build an octagonal tower on each front corner of the platform. Build a staircase to the top of the square platform. On top of the platform, build two octagonal towers on either side of a central gate. Above the gate, build a covered walkway with two thinner, tall towers at either end. Build smaller watch towers at intervals and at each corner along the rest of the main wall. Inside, you can recreate the white marble buildings and artwork that existed before the Sepoy Rebellion.

Answer Key

Chapter 1

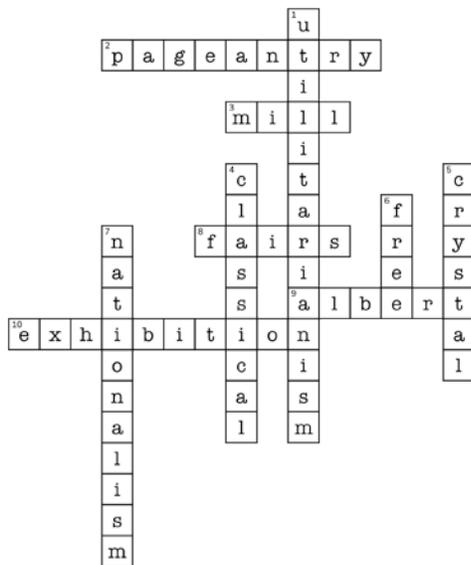
Vocabulary

1. G 2. B 3. J 4. H 5. A
6. F 7. E 8. I 9. D 10. C

Comprehension Questions:

1. Pageantry is something that shows off how powerful an empire is. Building cool things, large militaries, and flashy public spectacles are all forms of pageantry used to impress people.
2. To show off to the rest of the world how great Great Britain was.
3. Answers will vary but may include steam engine, telescope, counting machine, voting machine, loom, textiles, diamonds, and more.

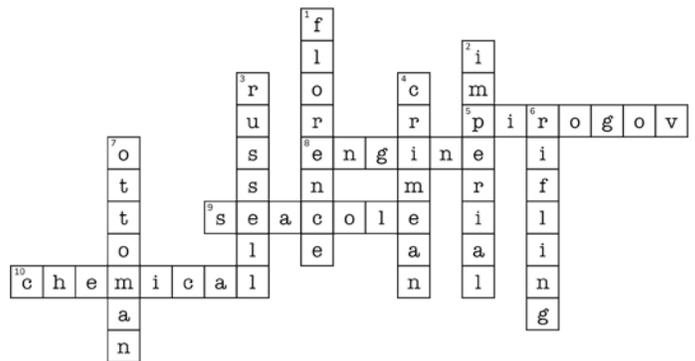
Crossword:



Christians within the Ottoman Empire instead of the Russian Emperor. France sent troops to the Black Sea, which sparked a war with Russia. Other countries joined because of their fear or dislike of Russia.

3. Railroads and telegraphs meant troops were better supplied and informed. Modern weapons like iron ships and naval shells, and rifling changed fighting and made it more deadly. Trench warfare was experimented with. Old tactics like bayonets and cavalry charges were still used.
4. A nurse from England who was sent to the Crimean War with a corps of nurses to improve medical care. She introduced cleanliness and whole-patient care to the hospitals. Her reforms were based on statistical data.
5. A nurse and businesswoman from Jamaica. She also traveled to the Crimean War to provide medical care. She taught the importance of cleanliness to British soldiers, cared for dying men, and ran a successful business until the end of the war.
6. A Russian doctor who made major advances in medicine during the Crimean War including field surgery, anesthesia, better amputation methods, and casts.

Crossword:



Chapter 2

Vocabulary

1. H 2. A 3. D 4. J 5. E
6. C 7. F 8. G 9. I 10. B

Comprehension Questions:

1. Answers may include: new legal code, abolished medieval guilds, modern baking system, new education system, modern army, decriminalized homosexuality, expanded women's rights, changed religious obligations/exceptions.
2. Napoleon III became the official protector of

Map Work:



Chapter 3

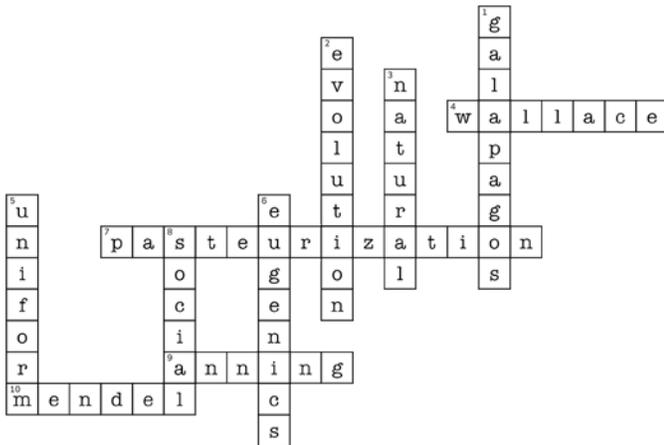
Vocabulary

1. B 2. E 3. F 4. A 5. I
6. D 7. C 8. G 9. J 10. H

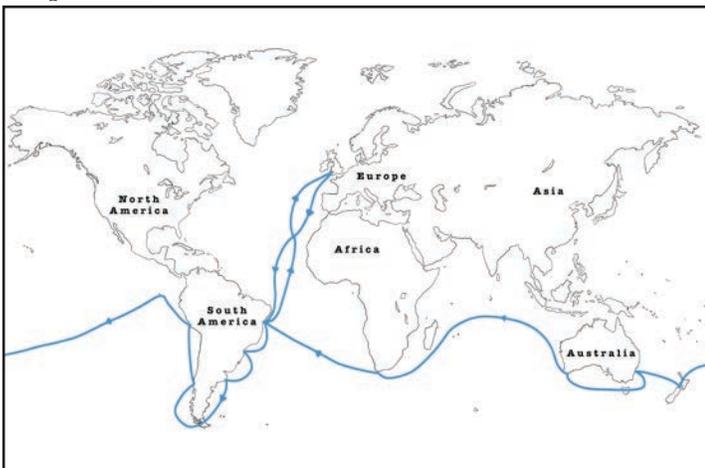
Comprehension Questions:

- Answers may include similarities and family-like relationship between different animals, proof of extinct animals, proof of animal change over time, uniformitarianism.
- Answers may include, seashells at the top of cliffs, giant extinct versions of modern animals, unique species on the Galapagos Islands, many variations in Galapagos finches, etc.
- Because it speculated about the origin of life, which is a scientific and religious topic. The theory contradicted some religious beliefs.
- Better scientific understanding of the origin of life, a growing divide between scientific and religiously minded people, the theory of social darwinism, the theory of eugenics.

Crossword:



Map Work:



Chapter 4

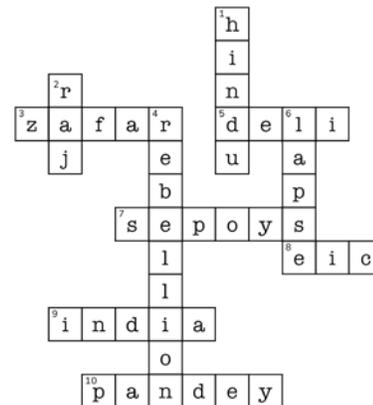
Vocabulary

1. F 2. A 3. G 4. B 5. E
6. J 7. H 8. D 9. I 10. C

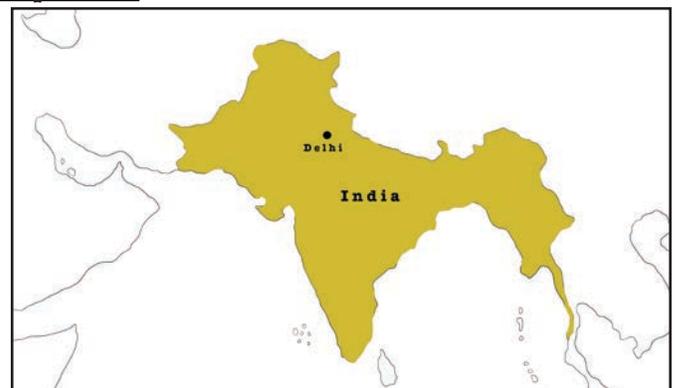
Comprehension Questions:

- High taxes, claiming land in exchange for unpaid taxes, strategic taxes to destroy Indian industry, treaties with rajas and maharajas to ally with the British, Doctrine of Lapse to claim even more land, exploiting old class and religious conflicts to keep Indians divided.
- Growing distrust of the British among sepoys. They feared the British would make them convert to Christianity. The fat on the gunpowder casings fed rumors and ultimately led to the rebellion.
- With extreme brutality. They killed many Indians and violated their religious beliefs as an act of revenge.
- Extreme poverty, famine, and increased conflict.

Crossword:



Map Work:



Chapter 5

Vocabulary

1. E 2. I 3. A 4. F 5. J
6. C 7. D 8. B 9. H 10. G